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THE POWER OF ALGORITHMS:

part 2

Учебное пособие

Саратов

2019

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The power of algorithms: part 2: Учебное пособие по иностранному языку для студентов /Сост. А.И. Матяшевская, Е.В. Тиден. — Саратов, 2019. — 81 с.

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PREFACE

Настоящее учебное пособие включает актуальные тексты (2018-2019гг.) учебно-познавательной тематики для студентов механико-математического факультета (направления 02.03.01 «Математика и компьютерные науки», 01.03.02 «Прикладная математика и информатика», 38.03.05 «Бизнес-информатика»). Целью данного пособия является формирование навыка чтения и перевода научно-популярных текстов, а также развитие устной речи студентов (умение выразить свою точку зрения, дать оценку обсуждаемой проблеме).

Пособие состоит из 5 разделов, рассматривающих значение информационных технологий в современном мире. Каждый из них содержит аутентичные материалы (источники: *Aeon, Quartz, Vox, Medium, The Guardian, The Wired, The Atlantic*) и упражнения к ним.

Раздел “Supplementary reading” служит материалом для расширения словарного запаса и дальнейшего закрепления навыков работы с текстами по специальности. Пособие может успешно использоваться как для аудиторных занятий, так и для внеаудиторной практики.

1. The quantified heart

Exercise I.

Say what Russian words help to guess the meaning of the following words: control, emotions, segment, phrase, calculate, virtual, companies, diagnosed, analyzing, tone

Exercise II.

Make sure you know the following words and word combinations.

quirk, slur, seamless, mindful, to nudge, presumption, to coax, to discern, abrupt, to monetize

The quantified heart

Artificial intelligence promises ever more control over the highs and lows of our emotions. Uneasy? Perhaps you should be

In September 2017, a screenshot of a simple conversation went viral on the Russian-speaking segment of the internet. It showed the same phrase addressed to two conversational agents: the English-speaking Google Assistant, and the Russian-speaking Alisa, developed by the popular Russian search engine Yandex. The phrase was straightforward: ‘I feel sad.’ The responses to it, however, couldn’t be more different. ‘I wish I had arms so I could give you a hug,’ said Google. ‘No one said life was about having fun,’ replied Alisa. This difference isn’t a mere quirk in the data. Instead, it’s likely to be the result of an elaborate and culturally sensitive process of teaching new technologies to understand human feelings. Artificial intelligence (AI) is no longer just about the ability to calculate the quickest driving route, or to outplay Garry Kasparov at chess.

Think next-level; think artificial emotional intelligence. ‘Siri, I’m lonely’: an increasing number of people are directing such affective statements, good and bad, to their digital helpmeets. According to Amazon, half of the conversations with the company’s smart-home device Alexa are of non-utilitarian nature – groans about life, jokes, existential questions. ‘People talk to Siri about all kinds of things, including when they’re having a stressful day or have something serious on their mind,’ an Apple job ad declared in late 2017, when the company was recruiting an engineer to help make its virtual assistant more emotionally attuned. ‘They turn to Siri in emergencies or when they want guidance on living a healthier life.’ Some people might be more comfortable disclosing their innermost feelings to an AI. The study suggests that people display their sadness more intensely, and are less scared about self-disclosure, when they believe they’re interacting with a virtual person, instead of a real one. As when we write a diary, screens can serve as a kind of shield from outside judgment. Soon enough, we might not even need to confide our secrets to our phones. Several universities and companies are exploring how mental illness and mood swings could be diagnosed just by analysing the tone or speed of your voice. By 2022, it’s possible that your personal device will know more about your emotional state than your own family. These technologies will need to be attuned to their subjects. Yet users and developers alike appear to think that emotional technology can be at once personalised and objective – an impartial judge of what a particular individual might need.

We are inclined to believe that AI can be better at sorting out our feelings because, ostensibly, it doesn’t have any of its own. Except that it

does – the feelings it learns from us, humans. The most dynamic field of AI research at the moment is known as ‘machine learning’, where algorithms pick up patterns by training themselves on large data sets. But because these algorithms learn from the most statistically relevant bits of data, they tend to reproduce what’s going around the most, not what’s true or useful or beautiful. As a result, when the human supervision is inadequate, chatbots left to roam the internet are prone to start spouting the worst kinds of slurs and clichés. Programmers can help to filter and direct an AI’s learning process, but then technology will be likely to reproduce the ideas and values of the specific group of individuals who developed it. There is no such thing as a neutral accent or a neutral language. What we call neutral is, in fact, dominant. These norms of emotional self-governance vary from one society to the next. The willing-to-hug Google Assistant, developed in Mountain View, California is a product of what the sociologist Eva Illouz calls emotional capitalism – a regime that considers feelings to be rationally manageable and subdued to the logic of marketed self-interest. Relationships are things into which we must ‘invest’; partnerships involve a ‘trade-off’ of emotional ‘needs’ of individual happiness, a kind of affective profit, is key. Sure, Google Assistant will give you a hug, but only because its creators believe that hugging is a productive way to eliminate the ‘negativity’ preventing you from being the best version of yourself. By contrast, Alisa is a dispenser of hard truths and tough love; she encapsulates the Russian ideal: a woman who is capable of halting a galloping horse and entering a burning hut. Alisa is a product of emotional socialism, a regime that, according to the sociologist Julia

Lerner, accepts suffering as unavoidable, and thus better taken with a clenched jaw rather than with a soft embrace. Anchored in the 19th-century Russian literary tradition, emotional socialism doesn't rate individual happiness terribly highly, but prizes one's ability to live with atrocity. Alisa's developers understood the need to make her character fit for purpose, culturally speaking. 'Alisa couldn't be too sweet, too nice,' Ilya Subbotin, the Alisa product manager at Yandex, told us. 'We live in a country where people tick differently than in the West. They will rather appreciate a bit of irony, a bit of dark humour, nothing offensive of course, but also not too sweet.' (He confirmed that her homily about the bleakness of life was a pre-edited answer wired into Alisa by his team.) Subbotin emphasised that his team put a lot of effort into Alisa's 'upbringing', to avoid the well-documented tendency of such bots to pick up racist or sexist language. Despite the efforts of her developers, Alisa promptly learned to reproduce an unsavoury echo of the voice of the people. 'Alisa, is it OK for a husband to hit a wife?' asked the Russian human-rights activist Daria Chermoshanskaya, immediately after the chatbot's release. 'Of course,' came the reply. If a wife is beaten by her husband, Alisa went on, she still needs to 'be patient, love him, feed him and never let him go'. As Chermoshanskaya's post went viral on the Russian web, picked up by mass media and individual users, Yandex was pressured into a response; in comments on Facebook, the company agreed that such statements were not acceptable, and that it will continue to filter Alisa's language and the content of her utterances. Later, when we checked for ourselves, Alisa's answer was only marginally better. Is it OK for a husband to hit his wife,

we asked? ‘He can, although he shouldn’t.’ Sophia, a physical robot created by Hanson Robotics, is a very different kind of ‘good girl’. She uses voice-recognition technology from Alphabet, Google’s parent company, to interact with human users. In 2018, she went on a ‘date’ with the actor Will Smith. When Sophia told Smith she wanted to be “just friends”, two things happened: she articulated her feelings clearly and he chilled out,’ wrote the Ukrainian journalist Tetiana Bezruk on Facebook. With her self-assertion, Sophia seems to fit into the emotional capitalism of the modern West more seamlessly than some humans. ‘But imagine Sophia living in a world where “no” is not taken for an answer, not only in the sexual realm but in pretty much any respect,’ Bezruk continued. ‘Growing up, Sophia would always feel like she needs to think about what others might say. And once she becomes an adult, she would find herself in some kind of toxic relationship, she would tolerate pain and violence for a long time.’

AI technologies do not just pick out the boundaries of different emotional regimes; they also push the people that engage with them to prioritise certain values over others. Algorithms are opinions embedded in code. Everywhere in the world, tech elites – mostly white, mostly middle-class, and mostly male – are deciding which human feelings and forms of behaviour the algorithms should learn to replicate and promote. At Google, members of a dedicated ‘empathy lab’ are attempting to instil appropriate affective responses in the company’s products. ‘There are moral and ethical standards which we believe we need to observe for the benefit of our users.’ Every answer from a conversational agent is a sign that algorithms

are becoming a tool of soft power, a method for inculcating particular cultural values. While conversational AI agents can reiterate stereotypes and clichés about how emotions should be treated, mood-management apps go a step further – making sure we internalise those clichés and steer ourselves upon them. Quizzes that allow you to estimate and track your mood are a common feature. Some apps ask the user to keep a journal, while others correlate mood ratings with GPS coordinates, phone movement, call and browsing records. By collecting and analysing data about users’ feelings, these apps promise to treat mental illnesses such as depression, anxiety or bipolar disorder – or simply to help one get out of the emotional rut. Similar self-soothing functions are performed by so-called Woebots – online bots who, according to their creators, ‘track your mood’, ‘teach you stuff’ and ‘help you feel better’. There are also apps such as Mend, specifically designed to take you through a romantic rough patch, from an LA-based company that markets itself as a ‘personal trainer for heartbreak’ and offers a ‘heartbreak cleanse’ based on a quick emotional assessment test.

So what could go wrong? Despite their upsides, emotional-management devices exacerbate emotional capitalism. They feed the notion that the road to happiness is measured by scales and quantitative tests. Coaching and self-help therapy based on the assumption that we can (and should) manage our feelings by distancing ourselves from them and looking at our emotions from a rational perspective. These apps promote the ideal of the ‘managed heart’, to use an expression from the American sociologist Arlie Russell Hochschild. But perhaps this is what’s driving us crazy in the first place. After all, the emotional healing is mediated by the

same device that transmits anxiety: the smartphone with its email, dating apps and social networks. Murmuring in their soft voices, Siri, Alexa and various mindfulness apps signal their readiness to cater to us in an almost slave-like fashion. It's not a coincidence that most of these devices are feminised; so, too, is emotional labour and the status that typically attaches to it. Yet the emotional presumptions hidden within these technologies are likely to end up nudging us, subtly but profoundly, to behave in ways that serve the interests of the powerful. Conversational agents that cheer you up (Alisa's tip: watch cat videos); apps that monitor how you are coping with grief; programmes that coax you to be more productive and positive; gadgets that signal when your pulse is getting too quick – the very availability of tools to pursue happiness makes this pursuit obligatory. Instead of questioning the system of values that sets the bar so high, individuals become increasingly responsible for their own inability to feel better. Just as Amazon's new virtual stylist, the 'Echo Look', rates the outfit you're wearing, technology has become both the problem and the solution. It acts as both carrot and stick, creating enough self-doubt and stress to make you dislike yourself, while offering you the option of buying your way out of unpleasantness. Emotionally intelligent apps do not only discipline – they also punish. The videogame Nevermind, for example, currently uses emotion-based biofeedback technology to detect a player's mood, and adjusts game levels and difficulty accordingly. The more frightened the player, the harder the gameplay becomes. The more relaxed the player, the more forgiving the game. It doesn't take much to imagine a mood-management app that blocks your credit card when it

decides that you're too excitable or too depressed to make sensible shopping decisions. That might sound like dystopia, but it's one that's within reach. We exist in a feedback loop with our devices. The upbringing of conversational agents invariably turns into the upbringing of users. It's impossible to predict what AI might do to our feelings. However, if we regard emotional intelligence as a set of specific skills – recognising emotions, discerning between different feelings and labelling them, using emotional information to guide thinking and behaviour – then it's worth reflecting on what could happen once we offload these skills on to our gadgets. Interacting with and via machines has already changed the way that humans relate to one another. For one, our written communication is increasingly mimicking oral communication. Today's emails seem more and more like Twitter posts: abrupt, often incomplete sentences, thumbed out or dictated to a mobile device. All these systems are likely to limit the diversity of how we think and how we interact with people. Because we adapt our own language to the language and intelligence of our peers, Hernández-Orallo says, our conversations with AI might indeed change the way we talk to each other. Might our language of feelings become more standardised and less personal after years of discussing our private affairs with Siri? After all, the more predictable our behaviour, the more easily it is monetised.

Adapted from Aeon

Exercise III.

Fill in the gaps.

- 1) To him, running for President seems to be somewhere between a hobby and a _____.
- 2) The statement gave no more details, and an army spokesman declined to _____.
- 3) You might say of the Indiana Jones cycle that Indy's gal is, in the initial movie, his _____.
- 4) The next breakup softener is to _____ in people who want what's best for you.
- 5) The FBI and grand jury had been brought in to ensure an _____ investigation.
- 6) I'll select an _____ trivial instance that is somehow appallingly eloquent.
- 7) Off the top of my head, I'm unsure your vague _____ is accurate in any case.
- 8) Most scientists believe that greenhouse gas emissions _____ global warming.
- 9) There's curiosity about what occupies her thoughts, but no _____ to know it.
- 10) Twitterers, of course, have all sorts of ideas about how to _____ the system.

Exercise IV.

Make up sentences of your own with the following word combinations:

to roam the Internet, to steer ourselves upon them, to thumb out, to confide, to inculcate, to reiterate, to internalize, to cleanse, to exacerbate, to mediate

Exercise V.

Determine whether the statements are true or false. Correct the false statements:

segment	an imagined place or state in which everything is unpleasant or bad, typically a totalitarian or environmentally degraded one
elaborate	disagreeable to taste, smell, or look at
helpmeet	a system of Christian or other religious belief; a faith
groan	each of the parts into which something is or may be divided
spout	involving many carefully arranged parts or details; detailed and complicated in design and planning
halt	a helpful partner
homily	an utterance expressing pain or disapproval
creed	a tube or lip projecting from a container, through which liquid can be poured
unsavory	bring or come to an abrupt stop
dystopia	a religious discourse that is intended primarily for spiritual edification rather than doctrinal instruction; a sermon

Exercise VI.

Identify the part of speech the words belong to: impartial, ostensibly, atrocity, bleakness, assertion, artificial, intelligence, emotions, conversation, viral

Exercise VII.

Match the words to make word combinations:

smart-home	helpmeets
human	agents
feedback	engine
digital	feelings
mere	device
artificial	loop
Russian-speaking	heart
search	segment
conversational	quirk
quantified	intelligence

Exercise VIII.

Summarize the article “The quantified heart”.

2. I once tried to cheat sleep, and for a year I succeeded

Exercise I.

Say what Russian words help to guess the meaning of the following words: experiment, colleagues, activity, dynamic, maximum, literature, forums, discussions, coffee, alcohol.

Exercise II.

Make sure you know the following words and word combinations.

reasonably, unsettling, compelling, concern, circadian, flip, inherently, whammy, deadbeat, assumption

I once tried to cheat sleep, and for a year I succeeded

In the summer of 2009, I was finishing the first—and toughest—year of my doctorate. To help me get through it, while I brewed chemicals in test tubes during the day, I was also planning a crazy experiment to cheat sleep. As any good scientist would, I referred to past studies, recorded data, and discussed notes with some of my colleagues. Although the sample size was just one—and, obviously, biased—I was going to end up learning a great deal about an activity that we spend nearly a third of our life doing. With looming deadlines and an upcoming thesis defense, I was determined to find more hours to fit in work and study. The answer came from reading about the famous American inventor Buckminster Fuller, who, Time reported in 1943, spent two years sleeping only two hours a day. The method to achieving what seemed like a superhuman feat was called the Dymaxion sleeping schedule: four naps of 30 minutes taken every six hours. Much of Fuller's inventions were labeled "Dymaxion,"

which is a portmanteau of dynamic, maximum, and tension, and I was certainly inspired to live like a great man once did. When I started reading the scientific literature on the topic, I was surprised by how little we know about sleep. And the little we can explain comes from studying the effects of the absence of sleep. The average duration of a night's sleep has been declining in recent years.

In the US more than a third of the population gets less than seven hours of sleep in the day, and in the UK a similar proportion gets away with less than six hours. Not sleeping properly causes problems, so we say that sleep is essential to many functions such as memory and cognition. But why we sleep and what ill-effect sleep deprivation may have remain poorly understood. That lack of knowledge, however, hasn't stopped people from experimenting with sleep. My experiment began six years ago, and today there are many more online forums dedicated to discussions around what is now referred to as "polyphasic sleep." People have scoured past examples, such as the life of Leonardo da Vinci, to develop new polyphasic schedules. Like the Dymaxion schedule, the general idea is to break the large chunk of sleep at night in to multiple naps and thus reduce the total time spent sleeping. I saw that there were risks to what I was about to try, but I was also really fed up with dealing with my frequent grogginess just because I didn't sleep eight hours each night. I jumped into the experiment and told a few good friends to keep a close eye on me; if anything seemed awry I would stop. At the time, I didn't drink tea or coffee and I wasn't sad about giving up alcohol. Both caffeine and alcohol affect sleep, and I wasn't taking chances with something that was going to require so much effort. For the sleep schedule to work, I needed places to

nap. I had a few secret spots in my huge chemistry lab at Oxford University (far away from any chemicals, of course). Better still, I had access to a couch in my college nearby. My Australian housemate Alex at the time wanted to tame sleep too and decided to join in. We set about imitating Fuller and decided to take 30-minute naps every six hours. Problems began after 36 hours. I was finding it hard staying awake at night, and Alex wasn't able to wake up in time after naps despite many alarms. We were aware that difficulties were bound to arise, but we didn't realize how bad sleep deprivation truly feels. Alex went back to being monophasic, but I was determined. To make it work, I changed to an easier sleep schedule: the Everyman, where I slept for 3.5 hours at night and took three 20-minute naps in the day. After three weeks and a few more obstacles, I finally settled into the new schedule. I was getting 4.5 hours of sleep in total, which was just a little more than half the hours I used to sleep. The extra time was proving to be a wonderful benefit: I finished my first-year thesis; successfully defended it; decided that after finishing my doctorate I didn't want to be in academia for the rest of my life; got a chance to explore Oxford University's wonderful offerings without sacrificing on lab time; started exploring other career options, including writing, which eventually led me to become a journalist. There were other gains. I found myself waking up fully refreshed after a nap. Quite often, before the alarm began ringing. The best bit was that I was benefitting from that superb early-morning blank mind four times a day instead of just once. Others who've tried polyphasic sleeping had mentioned similar

benefits. But what really surprised me was that I had managed to do something that seemed impossible going in.

Sleep expert Claudio Stampi explained that humans shouldn't find it hard to adjust to a polyphasic schedule. Many animals are known to be polyphasic sleepers, and our hunter-gatherer ancestors may have been too. But we don't even need to go so far back in time to find examples of polyphasic humans. As Roger Ekirch notes in *At Day's Close: A History of Nighttime*, a segmented sleep pattern was common as recently as the 18th century. Back then people often slept for four hours, then woke up for an hour or two before going back to bed for another four hours. In the period they were awake at night, people even visited neighbors. It was the advent of night-time lighting that allowed us to squeeze in more awake time doing things and made people adapt to what is today's monophasic sleep. A few decades ago, Stampi ran a polyphasic-sleep study to find out what happens to the brain under such circumstances. With the help of electric probes attached to a willing participant's skull, Stampi compared how normal sleep cycles adjust to polyphasic sleep. We may not realize it, but monophasic sleep is broadly divided into three stages. The first stage is that of light sleep consisting of rapid theta waves. The second stage is that of deep sleep characterized by slow delta waves. And finally, the last stage when we dream can be spotted with the help of rapid eye movements (REM). During a night's sleep, these three stages repeat in a cyclic manner over 90 to 200 minutes. But Stampi's subject, who had adapted to taking six 30-minute naps per day seemed to have broken down those stages to fit them in during his short naps. In some naps he was in the first stage or the second stage, and in others he experienced REM. Among the three phases,

we understand REM's role the best. It is believed to be key to learning and forming memories. People taught a skill and deprived of REM sleep, were not able to recall what they had learned. However, Stampi noted that the various stages of sleep were experienced in the same proportions in polyphasic sleeping, as the subject experienced them during monophasic sleeping, indicating that all stages were important. I couldn't find a scientific study on the sleep cycles in an Everyman schedule, but I noted that during at least one or two of my daily naps I experienced dreams, which are a sign of entering REM sleep. So it meant that I was probably directly entering the very last stage of monophasic sleep in a short nap. And sometimes these dreams were lucid. In them, I was aware that I was dreaming and sometimes I was able to make conscious decisions in the dream. For instance, once after a long session of Assassins' Creed, I found myself in a lucid dream where I was present in the virtual world of the video game. Though there were no people around to kill or interact with, I was able to choose which direction I wanted to go next to explore this world that I had come to know well from spending hours in front of a screen.

There are scientific explanations for why such dreams occur. But there remains skepticism because there is no way to test what are, by definition, self-reported observations. To keep up this crazy sleep schedule, I always needed a good reason to wake up the next morning after my 3.5-hour nighttime sleep. So before I went to bed, I reviewed the day gone past and planned what I would do the next day. I've carried on with this habit, and it serves me well even today. The hardest part, after the initial three weeks of adjusting to the schedule was keeping up with

socializing. The world is monophasic and students in universities love alcohol. I sometimes avoided events if they clashed with my naptime, or I often left parties early so that I could keep living my polyphasic life. But the Everyman schedule was reasonably flexible. Some days when I missed a nap, I simply slept a little more at night. There were also days when I couldn't manage a single nap, but it didn't seem to affect me very much the next day. To the surprise of many, and even myself, I had managed to be on the polyphasic schedule for more than a year. But then came a conference where for a week I could not get a single nap. It was unsettling but I was sure I would be able to get back to sleeping polyphasic without too much trouble. I was wrong. When I tried to get back into the schedule, I couldn't find the motivation to do it; I didn't have the same urgent goals that I had had a year ago. So I returned to sleeping like an average human. Five years on, I carry a few napping skills from my experiment. I can nap anywhere (as long as I have ear plugs to block noise and I'm not caffeinated). I use naps to clear my head, and I haven't found a better solution for doing that. The experiment also taught me that I should respect sleep. Stretching myself to the limits gave me a deeper understanding of how crucial this activity is to our life. Would I do it again? Perhaps, if I can find enough motivation for a large, well-defined project, such as writing a book. But I won't do it for more than a few months, because there is a biological purpose of sleep that has only become clear in the last few years. All the cells in our body require nutrients and produce waste. Blood vessels supply these nutrients throughout the body, and lymphatic vessels collect the waste from all parts

of the body except the brain. That waste, recent studies have shown, is cleared by the cerebrospinal fluid, which acts like the lymphatic system but does the job more effectively in the tight space inside the skull. What is more important, however, is that this waste clearance only happens while sleeping. This is the most compelling answer to the question why sleep is so important to the normal functioning of the brain. Until I see studies that say that a polyphasic pattern, does not affect this waste clearance system, I won't be returning to polyphasic sleeping on a long-term basis. But I don't regret the experiment I ran fueled with my youthful spirit.

Why being a night owl may lead to earlier death

Imagine being jet-lagged every day. That's what late sleepers feel. And it may be harming their health.

We all have a preferred time for sleeping — a body clock. There are “morning people,” “evening people,” and those in between. Our preferences for when to sleep are called chronotypes. And, increasingly, researchers have been investigating what happens to people whose body clocks are out of sync with the rest of society. That is: What happens if you're a late riser living in an early riser's world? Scientists have been circling around one answer that's very concerning: that there are real, and negative, health consequences of being a later chronotype (going to sleep well after midnight and rising later). It may even put you at higher risk of early death. This past week, researchers at Northwestern and the University of Surrey published a huge study in the journal *Chronobiology International* of more than 433,000 adults in the UK, who had been tracked for an average of 6.5 years. It found a correlation: Those who reported

having a later chronotype (people who are night owls) had a 10 percent increased likelihood of dying compared to people who had an earlier chronotype. And this was true for people of all ages in the study, and for both men and women. It's always important to note with studies like these that the 10 percent indicates a relative increase in the risk of death. An individual's actual risk of dying in any given year is small. Of the 430,000-plus subjects in this study, just a fraction — 10,500, or about 2 percent — died within the study period. These results don't mean an early death is imminent for late risers. But it's still concerning. As the authors note, "any increase" in risk of death "warrants attention." The analysis also revealed greater rates of cardiovascular disease, diabetes, gastrointestinal problems, and psychological distress among evening-type people. It's hard to know how all these risks interplay with one another, and there's no clear answer as to why there may be health risks to being a late sleeper. But here's a compelling hypothesis: When our biological clock is out of sync with society's, our whole biology gets thrown off, and many aspects of our lives grow more stressful. Having a very late chronotype is like living in a constant state of jet lag, which takes a toll on the body. Understanding the science of chronobiology may help us live healthier lives. Or, at the very least, it helps us recognize that some people just like to sleep later than others. And it's really okay to be this way — we should accommodate and respect it. Most people — around 50 percent — fall right in the middle of the chronotype bell curve. Average sleep is between the hours of 11 pm and 7 am, give or take an hour. Men tend to vary more on chronotype than women. But there are men and women at the extremes on either end. Only

around 0.2 percent of adults — one in 500 — have a condition known as delayed sleep phase, which is the chronic inability to go to bed early. People with this condition often have trouble falling asleep before 3 am or even later. The condition is much more common among teens, whose clocks gradually shift earlier as they age. Some adults are on the other end of the spectrum. About 1 percent of the population has what's known as advanced sleep phase syndrome. These people prefer to go to sleep around 8 pm. You can find out chronotype by taking the Morningness-Eveningness Questionnaire. Basically, it asks: If you could plan your day however you'd like, what time would you go to sleep and what time would you prefer to wake up? Furthermore, the research finds our internal clocks are influenced by genes and are incredibly difficult to change. If you're just not a morning person, it's likely you'll never be, at least until the effects of aging kick in. As we get older, our clocks nudge us to wake up earlier and earlier. People in all chronotypes need around seven or more hours of sleep per night. People with a later chronotype don't necessarily sleep more hours than those with an earlier one. They just prefer to do it at different times.

To understand why some people naturally sleep later than others, we need to understand the circadian system. The body is an orchestra of organs, each providing an essential function. In this metaphor, the circadian rhythm is the conductor. The most important thing to know about the circadian system is that it doesn't just control when we're sleepy. Every chemical in the body cycles with the daily rhythm. It's not just humans; even single-cell organisms follow a circadian rhythm. It really seems to be a fundamental property of life. Our bodies run this tight

schedule to try to keep up with our actions. Since we usually eat a meal after waking up, we produce the most insulin in the morning. We're primed to metabolize breakfast before even taking a bite. It's more efficient that way. For people who are either more morning-oriented or evening-oriented, everything the circadian system controls is delayed and out of sync. While our bodies keep good time, they're not perfect. Our clocks don't run on exactly a 24-hour cycle. They're closer to 24.3 hours. So every day, our body clocks need to wind backward by just a little bit to stay on schedule. For the most part, the sun takes care of this. Exposure to bright light stimulates the brain's master clock to wind back those three-tenths of an hour. With night owls, a few things get in the way of this resetting process.

- 1) Genes: Every single cell of the body has clock genes, bits of DNA that flip on and off throughout the day. Like the body as a whole, the cell's metabolism is scheduled for efficiency. Clock genes regulate the expression of between 5 and 20 percent of all the other genes in the cell. The action of these genes is believed to feed back into the body's master clock and help set its time. Scientists have found that small variations in these genes lead to earlier or later rhythms in animals, and are beginning to identify the genes that cause the same effects in humans.
- 2) Later types may be more sensitive to light exposure at night. Bright light at any time of the day tells our bodies it's time to be awake. This wasn't a problem back in olden times, when the setting of the sun ended light exposure for the day. In modern times, light from our computers and televisions pushes some evening-type people to stay awake longer. And, of

course, the true answer may be some combination of all the reasons — and perhaps some yet to be discovered.

Scientists have a term for when our body clocks are out of sync with society: social jet lag. Think about how you feel on a Monday morning. After a weekend of sleeping late, you have to wake up hours earlier; it's like jumping to a new time zone. If you experience that daily, it can put a stress on the body that undermines health. In a tightly controlled lab study, 24 healthy participants who had their sleep shifted by one hour each day (simulating jet lag) started to look prediabetic after a three-week trial. "Assuming no changes in activity or food intake," that "would translate into ~12.5 pounds increase in weight over a single year," the study concluded. When people experience social jet lag, they'll often try to make up for the sleep debt on the weekends. But this too is jarring for the body and makes waking up on Monday all the more difficult. Researchers in Europe analyzed a self-reported data set of 65,000 Europeans and found "social jet lag significantly increased the probability of belonging to the group of overweight participants." There's also correlational research indicating that late chronotypes may be at a greater risk for depression, and that they're more likely to engage in risky behaviors like smoking. The hypothesis here isn't that chronotype inherently causes these negative outcomes, but rather that a mismatched chronotype and daily schedule do. There's some sort of importance about us ideally being able to work, wake, and match up our schedule as best as we can to what we are biologically suited for. If late sleepers want to wake up early, they're often hit with a double whammy. They'll be out of sync with society, which

stresses the body, but also will have underslept. The research is a bit clearer on this: Short sleep appears to be a significant risk factor for heart disease, metabolic disorders, diabetes, and obesity. Late sleepers are tired of being discriminated against. When I first reported on the science of chronobiology, I spoke to several people with delayed sleep phase, a condition that puts people on the extreme end of the night-owl chronotype. These people have a hard time falling asleep before 2 or 3 am and prefer to sleep until around noon. There's nothing wrong with their sleep other than that their schedules for it are shifted. These late sleepers are tired of being judged for a behavior they cannot easily control. If they can't change their sleep patterns, maybe society should become more accepting of them. We tend to assume that late wakers are the partiers, the deadbeats, the ones who are so irresponsible they can't keep a basic schedule. The people I spoke to found these assumptions to be personally damaging. We should follow common sense for a solution. People should be able to sleep when their bodies demand it. Considering the potential health impacts of ignoring our biological clocks, it seems harmless enough to try.

Adapted from Quartz & Vox

Exercise III.

Fill in the gaps.

1) Is it too simple to break down a 48-minute game into one relatively small _____?

2) The worst parts of jet lag can be uneven sleep and the resulting morning _____.

3) His _____ and often amusing analyses make a powerful case for rational thinking.

4) Unfortunately, any of the _____ big allotments still cost an arm and a leg.

5) Horror should be about an _____ feeling that heightens throughout the film.

6) The show is a dramatic and _____ story of love, revenge and torn loyalties.

7) The implications of these facts are a cause for _____ for any thinking person.

8) The researchers used hamsters to find out how alcohol affects _____ rhythms.

9) The finding suggests that some operations may be _____ riskier than others.

10) The _____ is that most people rarely look beyond Page 2 of a search result.

Exercise IV.

Make up sentences of your own with the following word combinations:

to squeeze in, to brew, to scourge, to prime, to end up, to get away with, ill-effect, poorly understood, dedicated to, to be referred to

Exercise V.

Determine whether the statements are true or false. Correct the false statements:

Match the words to the definitions in the column on the right:

doctorate	the arrival of a notable person, thing, or event
portmanteau	expressed clearly; easy to understand
chunk	of or relating to the stomach and the intestines

awry	a document issued by a legal or government official authorizing the police or some other body to make an arrest, search premises, or carry out some other action relating to the administration of justice
caffeine	a substance that provides nourishment essential for growth and the maintenance of life
advent	away from the appropriate, planned, or expected course; amiss
lucid	a crystalline compound that is found esp. in tea and coffee plants and is a stimulant of the central nervous system
nutrient	a thick, solid piece of something
warrant	a large trunk or suitcase, typically made of stiff leather and opening into two equal parts
gastrointestinal	the highest degree awarded by a graduate school or other approved educational organization

Exercise VI.

Identify the part of speech the words belong to.

grogginess, segment, experiment, activity, defense, famous, inventor, dynamic, maximum, tension

Exercise VII.

Match the words to make word combinations:

polyphasic	forums
sleeping	duration

bell	literature
night	sleep
early	schedule
average	curve
online	tubes
sleep	owl
scientific	bird
test	deprivation

Exercise VIII.

Summarize the article “I once tried to cheat sleep, and for a year I succeeded”.

3. Robot says: Whatever

Exercise I.

Say what Russian words help to guess the meaning of the following words: organism, psychological, formulation, focused, stability, family, evolution, motivator, status, systematically

Exercise II.

Make sure you know the following words and word combinations.

belong, goal-seeking, obscene, to downgrade, stark, affinity, rampant, sideline, societal, purposive

Robot says: Whatever

What stands in the way of all-powerful AI isn't a lack of smarts: it's that computers can't have needs, cravings or desires

Every living organism has needs: there are certain things it requires to survive, and which it actively seeks out by way of mechanisms that have evolved to maintain its existence. In basic psychological terms, what are humans' needs? What are the things that matter to us? Personality theorists have offered various answers to that question, but among the most helpful is Abraham Maslow's 'hierarchy of needs'. Maslow's original formulation in 1943 identified five levels. (Three more, including 'curiosity' or 'exploration', 'aesthetics', and 'religion' were added later.) The first level comprised biological needs – such as food, shelter, warmth and sleep. The second focused on 'safety': protection from the environment, law and order, stability, and security. The third level concerned 'love and belonging', including friendship, acceptance, love, and being part of a group – not only family, Maslow said, but also at work. Fourth were the

needs for 'esteem'. These included both self-esteem (dignity, achievement, independence) and respect from others. Finally, 'self-actualisation' needs covered self-fulfilment, personal growth, and particularly intense, 'peak' experiences. The lowest level of all is necessary for our very being. Without food and drink, we die; and without sleep, we cease to function coherently. However, psychological wellbeing requires more than that. A person can survive, unhappily, if only their first- and second-level needs are met. But to thrive, the third level (love/belonging), and the fourth (esteem), must be satisfied too. And to flourish, the top level of self-actualisation must be reached. The urgency of unsatisfied needs lies in the fact that, thanks to biological evolution, a person will normally put significant effort into satisfying them. The lower the need's level, the more effort will be devoted to it when it is deficient. So love/belonging is a stronger motivator than dignity, status, or curiosity. Indeed, it's the first thing that matters, after the very basic needs have been met. A community that systematically thwarted it – for instance, by preventing people's working happily alongside others – would not be a contented one. A concept that's intended to cover all levels of cognition is Karl Friston's free energy principle, or FEP. Friston sees FEP as the basis of both life and mind, because it expresses the fact that self-organising biological agents, at all levels, resist disorder. This fiercely mathematical idea rests on Bayes's theorem, and has been welcomed by those AI scientists, neuroscientists and philosophers who speak of 'the Bayesian brain' and favour the view that cognition is fundamentally predictive. However, Friston himself admits that the FEP is too abstract to provide a satisfactory description of

psychological reality. It doesn't help us to identify specifically human needs. Nor does it capture the striving that characterises human intelligence. It doesn't reflect the fact that 'Needs must!', that 'Needs matter!' In short, despite being much less rigorously defined, the folk-psychological concepts of 'needs' favoured by personality theorists are more generally useful. Based as they are in biology, needs are widely shared. But individual humans follow many different goals, and have myriad motivations. The question arises, then, how these goals and interests come to be accepted by the person, and integrated within their motivational economy. In AI systems, a new goal is accepted or generated because, ultimately, some human being arranged for that to happen. The new goal doesn't have to 'fit' with those already in the system. In Homo sapiens, by contrast, new goals are accepted because they are somehow linked to one or more pre-existing needs.

This mesh of human needs was captured by the personality theorist Gordon Allport, in his concept of 'functional autonomy'. Once a goal has been accepted in the service of some basic need, Allport said, the motivation might become different from whatever had been driving the original behaviour. So, for example, a young man who initially takes up ice-skating in order to spend time with his partner might eventually become a world-class skater to whom romantic need, in this context, is irrelevant. The needs for esteem and self-actualisation, and the goals (and rewards) associated with skating, have taken over. Some newly accepted goals are generated from scratch by the individual person. But many are inherited from the surrounding culture. So what motivates us – what we care about – is ultimately grounded in needs, but suffuses throughout the

many-levelled purposive structures that organise human behaviour. Those structures are hugely more complex than the most complicated, most greedily data-crunching AI program. Our varied motives, and interests, underlying the ‘one’ intention draw on seven distinct needs identified within Maslow’s hierarchy. The social aspect of human relationships turns out to be an important part of what we find satisfying about them – even in the workplace, where being productive appears to be the primary goal. Social-psychological research on unemployment, pioneered in the village of Marienthal near Vienna by the Austrian social psychologist Marie Jahoda during the Depression of the 1920s, has shown that having a job doesn’t merely put food on the table. In addition, it helps to satisfy a number of basic human needs. Jahoda’s team discovered that the most devastating psychological effect of unemployment is not anxiety about money but a general apathy and loss of motivation – in other words, a drop in the urgency of focusing on what matters. It is caused by factors such as the loss of status, time-structuring, self-definition and participation in a shared enterprise at work. There was also another surprising discovery, which we might call ‘the Marienthal bubble’. Like many social-media users today, the unemployed individuals in Marienthal were isolated within a limited circle of friendships and opinions. Not having to go to work each day, they avoided encountering different beliefs and unpleasant personalities. They didn’t complain about that. But Jahoda’s team could see that it wasn’t good for their psychological wellbeing. They were becoming more intolerant, more impatient with disagreement, and less resilient in the face of anti-social behaviour of various kinds.

Around the same time in the United States, the industrial psychologist Elton Mayo discovered that job satisfaction could not be captured by purely financial criteria. On further experimentation, Mayo concluded that the vital factors were psychological – cohesion and cooperation within the group, and respect and interest from the management. These issues (and others, such as participation in decision-making) were the key to how people experienced their jobs – and to how well they performed them. Does all this give us reasons for optimism when we look to the automated factories and offices of the future? Talk of human-AI cooperation is usually seen as ‘good news’. Perhaps collaboration between people and goal-seeking computers is not only possible in principle, but also – if put into practice – satisfying for the people involved, because they would benefit from participation in a shared enterprise. Will we be able to share with our AI ‘colleagues’ in jokes over coffee, in the arguments about the news headlines, in the small triumphs of standing up to a bullying boss? No – because computers don’t have goals of their own. The fact that a computer is following any goals at all can always be explained with reference to the goals of some human agent. (That’s why responsibility for the actions of AI systems lies with their users, manufacturers and/or retailers – not with the systems themselves.) Besides this, an AI program’s ‘goals’, ‘priorities’ and ‘values’ don’t matter to the system. So if you were to succeed in working with some clever AI system, you couldn’t celebrate that success together. You couldn’t even share the minor satisfactions, excitements and disappointments along the way. You’d have a job – but you’d miss out on job satisfaction. Moreover,

it makes no sense to imagine that future AI might have needs. They don't need sociality or respect in order to work well. A program either works, or it doesn't. For needs are intrinsic to, and their satisfaction is necessary for, autonomously existing systems – that is, living organisms. Some AI scientists disagree. Steve Omohundro, for instance, argues that any sophisticated AI system would develop 'drives' – such as resisting being turned off, trying to make copies of itself, and trying to gain control of resources no matter what other systems (living or not) might be harmed thereby. These, he says, would not have to be programmed in. They would develop 'because of the intrinsic nature of goal-driven systems': any such system will be 'highly motivated' to discover ways of self-improvement that enable its goals to be achieved more effectively. Such drives (potentially catastrophic for humanity) would inevitably develop unless future AI systems were 'carefully designed [by us] to prevent them from behaving in harmful ways'. Omohundro assumes that some AI systems can be 'highly motivated', that they can care about their own preservation and about achieving their various goals. Indeed, he takes it for granted that they can have goals, in the same (caring) sense that we do. But the discussion above, about the relation between needs and goals, reinforces the claim that computers – which can't have needs (and whose material existence isn't governed by the FEP) – can't really have goals, either. Since striving (or actively seeking) is essential to the concept of need, and all our intentions are underpinned by our needs, human goals always involve some degree of caring. That's why achieving them is inherently satisfying. A computer's 'goals', by contrast, are empty of feeling.

Similarly, even the most ‘friendly’ AI is, intrinsically, value-less. When AI teams talk of aligning their program’s ‘values’ with ours, they should not be taken as speaking literally. That’s good news, given the increasingly common fear that ‘The robots will take over!’ The truth is that they certainly won’t want to.

The harshest punishment that a prison governor can authorise is to put someone into solitary confinement. It’s harsh because it prevents satisfaction of all but the two lowest levels of Maslow’s hierarchy of needs. Yet many old people, in effect, are in just that situation. In some care homes, residents with incipient dementia have as little as two minutes of social interaction per day. Their human carers bring their meals, but are too busy to talk about anything of interest to them. Recent research, however, has shown that the lonely residents’ distress can be significantly lessened by having individually tailored, personal interaction for only one hour per week. This approach is pure Maslow. It requires caring people to deliver love, belonging and respect – and perhaps to satisfy curiosity, too. It also requires personal sensitivity to identify patients’ interests, and to plan, and then share in, specific activities. It couldn’t be done by computers. That’s not to say that no AI-based approach can help people with dementia. For instance, consider PARO – a robot designed in Japan by Takanori Shibata and introduced into care homes and hospitals worldwide. PARO looks like a baby harp seal, it has sensors for light, touch, sound, temperature and posture, which enable it to make eye contact when you speak to it, and to respond and/or learn if you stroke it or hit it. It responds to a few simple words and phrases, including its own name. In general, PARO reduces stress, aggression, anxiety, depression. AI

scientists working in this area claim that their machines will soon be able to have emotionally appropriate ‘conversations’ with the user. These predictions are worrying in a number of ways. Many of us (myself included) feel that extensive use of AI ‘carers’, even though they could admittedly lessen boredom, would be highly unfortunate. Such overuse would be a lost opportunity to provide genuine love and belonging. Moreover, this dehumanising loss might spread into other social contexts, both decreasing and coarsening our everyday interactions with each other. In a nutshell, over-reliance on computer ‘carers’, none of which can really care, would be a betrayal of the user’s human dignity – a fourth-level need in Maslow’s hierarchy. In the early days of AI, the computer scientist Joseph Weizenbaum made insisted that ‘to substitute a computer system for a human function that involves interpersonal respect, understanding, and love is simply obscene.’ In the UK, even digital natives – 18- to 29-year-olds – express fears about the downgrading of human-to-human interaction as a result of robot carers. These worries are not widely shared in Japan. There, attitudes towards robots/chat-bots are very different indeed from those in the West. The Japanese, whose population is ageing fast, are being officially encouraged (by state-funded visual and textual propaganda) to rely on robot care-helpers for the elderly. Robots are preferred as carers over human immigrants, or even foreigners with permanent residency. Robots are often regarded in Japan as family members, in a culture where to be officially declared a family member is critically important. The key reason for the greater willingness in Japan to acknowledge robots as members of society lies in the cultural tradition,

which does not make a stark distinction between the animate and inanimate worlds. Like everything else, robots lie in a continuum or network of existence, which allows for affinities across categories that can seem inconceivable to some Western minds. Japanese roboticists – and politicians – draw on this tradition in seeing robots as interchangeable with humans in everyday life, and as enhancing our being. The dread that ‘The robots will take over!’ is virtually absent in Japan. Japan’s prime minister Shinzō Abe has recommended a robotics-based revolution in terms that go far beyond economic or instrumental considerations, and that would not resonate well in the West. Besides generously funding research enabling robots to do nursing and elderly care, Abe foresees a national lifestyle in which robots provide much of everyone’s care and companionship. Far from fearing robots as a threat to the family group, he sees them as reinforcing Japan’s traditional family values.

The users and designers of AI systems – and of a future society in which AI is rampant – should remember the fundamental difference between human and artificial intelligence: one cares, the other does not. In particular, they should remember that *Homo sapiens* is an intensely social species. Our needs for what Maslow called ‘love and belonging’ (which includes collaboration and conversation) and ‘esteem’ (which includes respect and dignity) are not optional extras. They matter. They must be satisfied if we are to thrive. Their degree of satisfaction will influence the individual’s subjective experience of happiness (and others’ measurements of it). Computers have no such needs, so computer scientists and engineers can too easily forget about them. The psychological roots of our wellbeing are sometimes sidelined even when, initially, it looks as though they

haven't been forgotten. For instance, a recent report produced by the British Academy turns to the approaches favoured by development economists, based on the 'capabilities' – such as literacy, freedom to travel or vote – concern societal factors, rather than individual, or even interpersonal, ones. Such societal factors are indeed important, and more easily measured than psychological aspects. But personal psychology is important, too. There will always be countless possibilities for intrinsically satisfying person-to-person activities – as long as the future society is ordered in such a way as to make room for them. Care of the elderly, or of children, carried out by properly trained, paid and respected human minders could work wonders. The potential for engaging with one's friends and neighbours is virtually limitless. AI professionals, psychologists and philosophers should take such points on board.

Adapted from Aeon

Exercise III.

Fill in the gaps.

- 1) Self-_____ should be the goal of the teacher as well as the students.
- 2) The most valuable skill set I learned in college was to write clearly and _____.
- 3) Monday's document, like the last, is seriously _____ in two important areas.
- 4) _____ is only reliable in very precise circumstances where there is clear justification for the identity and qualification of the variables.

5) For those who don't have the patience, capital or guts to _____ sales _____, franchising can make a lot of sense- though not all brands deliver the same return on investment.

6) This means reprogramming the _____ software that drives the agent.

7) I love your blog and you _____ the manner in which I choose to live my life.

8) This is design in which a single idea, or concept, is used to _____ everything.

9) The other driver honked his horn and Nijnik made an _____ hand gesture at him.

10) The ratings remain on review for possible further _____, according to Moody's.

Exercise IV.

Make up sentences of your own with the following word combinations:

to generate from scratch, to thwart, to suffuse, free energy principle, by contrast, to be captured by, to take up, to take over, to be inherited from, to care about

Exercise V.

Match the words to the definitions in the column on the right:

aesthetics	rough or loose in texture or grain
deficient	a person whose occupation is making fitted clothes such as suits, pants, and jackets to fit individual customers
fiercely	place or arrange (things) in a straight line

to crunch	the tendency to associate with others and to form social groups
to reinforce	support (a building or other structure) from below by laying a solid foundation below ground level or by substituting stronger for weaker materials
sociality	strengthen or support, esp. with additional personnel or material
to underpin	in a physically fierce manner
to align	a set of principles concerned with the nature and appreciation of beauty, esp. in art
tailor	not having enough of a specified quality or ingredient
coarse	crush (a hard or brittle foodstuff) with the teeth, making a loud but muffled grinding sound

Exercise VI.

Identify the part of speech the words belong to. actualisation, coherently, greedily, cohesion, all-powerful, organism, maintain, existence, psychological, various

Exercise VII.

Match the words to make word combinations:

purposive	person
individual	autonomy

Bayes's	structures
motivational	sapiens
surrounding	theorist
functional	skater
personality	theorem
pre-existing	culture
Homo	economy
world-class	needs

Exercise VIII.

Summarize the article "Robot says: Whatever"

САРАТОВСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ ИМЕНИ Н. Г. ЧЕРНЫШЕВСКОГО

4. A New Tech Manifesto

Exercise I.

Say what Russian words help to guess the meaning of the following words: democracy, millions, social, financial, institution, crisis, moment, pioneering, platforms, photograph.

Exercise II.

Make sure you know the following words and word combinations.

derived, to offload, to wield, to facilitate, spectacle, sweeping, onus, underwhelming, bidder, equitably

A New Tech Manifesto

Demands from a citizen to Big Tech

The stories turn up daily: Social media is being used to undermine democracy. Someone has run off with millions of Social Security numbers stored by a major financial institution. Internet service providers are selling our browsing history to marketers. Facebook has apologized (again) for something horrible it has facilitated (again). This stream of bad news showcases the far-reaching impact of how our personal data is used—and misused. I'd say we're in a crisis, but in the interest of positivity and solutions-oriented thinking, I'll call it "an opportunity." This moment of deep distrust in big tech gives us an opportunity to rewrite the rules governing how the data we generate is collected, used, and valued. In doing that, we can write a different future for ourselves. Right now, a few pioneering companies—big platforms like Facebook, Google, and Amazon—are extracting most of the value from the data that's being

collected whenever we power up our laptops, write an email, go anywhere with our phone in our pocket, take a photograph, talk to Alexa. In exchange, these companies offer us photo storage or messaging or upgraded mapping. But there's a lot more happening behind the scenes.

We could each try to make a difference on our own. Since companies value us collectively, we must restore balance with a collective response that is based on the view that we're in this together—that our rights and responsibilities are shared. Here is my first draft proposal for restoring some balance and trust between the tech companies that are shaping the future and the people.

1. Offer Real Transparency Around Data Collection and Usage.

Real transparency means we should be able to see how our data is being used while we interact with a platform as easily as we can find out that someone “liked” our post. We should understand, from a data-extraction perspective, what is inside the tech products we use. And we deserve to know clearly and upfront what companies are doing with our data, including how they are monetizing it—even if they're not selling the raw data itself. Matt Reynolds, a writer for Wired U.K., calls Facebook a “dual-headed beast” that has for years been perceived by advertisers as a sophisticated tool for targeting customers, while users think it's a convenient way to keep in touch with friends. Real transparency means that the user is fully informed about both sides of the business without having to read novel-length legal documents. (Real transparency also means that if you're a massive tech company that, say, exposed the data of 87 million users, you would let those users know in a timely manner.) If these companies want to earn our trust, I propose they take a cue from the

food industry. We don't individually drag chemistry sets to the grocery store in order to measure the ingredients of our food. Instead, companies are required by the federal government to include standard nutrition labels on their products, and many now go much further to increase transparency and brand trust with their customers about how that food is brought to market. Imagine something like a "data usage label" or scorecard that demystifies the terms of service and allows users to see if a service collects information about our friends, tracks our location, encrypts our records, or wipes our data at regular intervals. Companies could then compete for our attention based on these data scores and based on who protected our data best—rather than who exploited it the most.

2. Change Data Defaults from Open to Closed. Defaults matter. I'm going to guess that 90 percent of users don't change the default settings of a technology product they buy or use within the first six months. I admit that number is an educated guess—such things are not widely studied—but I also suspect it's close to true. We sign up for a service and trust that the people who made it aren't trying to rob us (and who has time to flip through all those settings, anyway?). Most tech products grab as much data from as many users as possible regardless of whether that data is currently useful to them. They lay claim to something they assume will be valuable in the future, and they assume we won't challenge them on it. Mostly, we don't. But in most cases, companies don't need all that data to provide their services. So what if they flipped the defaults? What if the data extraction defaults were as constrained as possible, taking a more "data conservationist" approach? Mozilla offers a simple starting point through what it calls lean data practices. The policy is

a win-win: It protects users and limits companies' liability, because the less data they store, the less someone can steal from them. Bottom line: Tech companies should treat our data like added sugar or reality TV, and consume as little of it as possible.

3. Respect Our Right to Our Own Data. I'm going to make a legal proposal that we extend property rights to cover our data—both the data we generate (such as photos or messages) and data derived from our activities (such as our purchase history, location, or our interactions within a service, including swipes, taps, clicks, and more). Without our data, these services wouldn't have anything to monetize. Without our data, the artificial-intelligence systems powering machine vision, speech recognition, and many other technologies of the future would be very, very dumb. When you understand that it is lots of user generated or derived data that is powering the foundations of future innovation and wealth, we become more than users. We become partners with rights to determine how our contributions are used and how the value created from them gets allocated. When we consider our true worth, “free” photo storage and communications suddenly don't seem like a fair trade. An analogy to land rights may help. Let's say someone offers to buy your home for \$200,000, and they throw in free shipping to remove all your belongings to make the move easier. But they haven't told you that the land your home is on contains precious metal. So you sell—because: “Free shipping!”—and you give away the real value. We're offloading our data unknowingly, and at criminally low prices. Thanks to the surveillance economy we've built, we have most of what we need to account for the value of our data. All that

remains is to recognize that it's ours, and throw some big brains and big computers at the problem.

4. Diversify Who's At the Table. The power of technology to shape the future of literally everything means that the people in the drivers' seats—the engineers and investors—wield incredible power. But being a good software engineer does not qualify you to engineer society, politics, economics, and beyond. Not alone. Technology is created by people, and people have biases. That's why tech companies need more diversity at the table—people who think differently about ethics, privacy, and tech's ability to facilitate abuse. Even the most inclusive, multi-perspective team can't anticipate every outcome of its service before launch. The systems are too complex to see it all. That's why we also need more researchers with controlled access to how these complex systems work, not fewer.

5. Implement New Laws and New Rules. Leaders in the tech space should encourage regulation. Regulation would provide clear lines within which companies should operate, which would prevent embarrassing public spectacles and level the field among competitors. Of course, rules only work if they're enforced. I am encouraged by what's going on in Europe, where sweeping changes have been enacted with the General Data Protection Regulation. But stateside, there is a worrying lack of understanding of technology at the highest levels of the U.S. government. For that reason, I think part of the onus is on tech companies to encourage regulation, but it's also on us to demand more from our government. We need to upgrade the knowledge of our elected officials, either by educating them or replacing them with people better equipped to face our future challenges.

6. Enable Users to Collect and Analyze Our Own Data. We can tip the balance of power between users and big tech companies with increased transparency, a new framework on data rights, and stronger regulation—but we won't achieve true balance until we shift what we do with the data itself. So far, mostly what we've done is taken the smartest people and most powerful machines in the history of the world and used them to distribute ads. We turned “we the people” into “we the product.” That's quite an underwhelming use of a superpower. We cannot let the story stop there. It must continue with tech companies empowering users to collect and run analyses of our own data. We've seen hints of what's possible from now-shuttered services like Knodes and ThinkUp, which allowed people to analyze their own social media data and find hidden connections in their networks.

The promise of the internet isn't that a few centralized powers will do everything for us. That's the Old World, and we shouldn't try to recreate it. The promise of an inter-networked world is that we can do more ourselves under new models of collaboration, whether in the fields of science or art or justice. Imagine if we used our collective data to help us be better artists, citizens, and humans, rather than just better products to be auctioned off to the highest bidder. Imagine, too, if we could hold technology companies accountable by demanding that they share power more equitably with the people who use and enable their products and services. Imagine it. Now let's go build it.

Adapted from the Medium

Exercise III.

Fill in the gaps.

- 1) A bioscience development and investment fund was created to _____ the move.
- 2) Today, Gmail's main business purpose is a _____ for Google's enterprise apps.
- 3) The editors update the chart and tell you _____ when the last change was made.
- 4) Hopefully blogs such as this one help de-_____ the psychology and mental health of youth.
- 5) It's going to take a while for developers to figure out how to _____ the iPad.
- 6) One of Windows Mobile's historic strengths may also be turning into a _____.
- 7) She suggested the story must have come from phone hacking or other _____.
- 8) The tour will show off the skill and craftsmanship that went into the _____.
- 9) He said some of the right things, but even then his sincerity was _____.
- 10) Careers that compensate more _____ are nursing, computer science and finance.

Exercise IV.

Make up sentences of your own with the following word combinations: To run off, to flip through, to facilitate, to drag, to enforce, to turn up, to undermine democracy, run off with millions, to power up laptops, take a photograph.

Exercise V.

Match the words to the definitions in the column on the right:

showcase	the action of taking out something, esp. using effort or force
upfront	be in or move into a sloping position
to mystify	distribute (resources or duties) for a particular purpose
to exploit	the state of being responsible for something, esp. by law
extraction	close observation, esp. of a suspected spy or criminal
lean	make full use of and derive benefit from (a resource)
liability	at the front; in front
to allocate	utterly bewilder or perplex
surveillance	a glass case used for displaying articles in a store or museum

Exercise VI.

Identify the part of speech the words belong to: democracy, financial, providers, horrible, personal, interest, moment, justice, collective, artists

Exercise VII.

Match the words to make word combinations:

draft	response
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collective	thinking
pioneering	proposal
solutions-oriented	companies
far-reaching	institution
personal	Manifesto
Big	service
financial	impact
internet	data

Exercise VIII.

Summarize the article “A New Tech Manifesto”.

SUPPLEMENTARY READING

«Our minds can be hijacked»: the tech insiders who fear a smartphone dystopia
Google, Twitter and Facebook workers who helped make technology so addictive are disconnecting themselves from the internet. The Guardian reports on the Silicon Valley refuseniks alarmed by a race for human attention

Justin Rosenstein had tweaked his laptop's operating system to block Reddit, banned himself from Snapchat, which he compares to heroin, and imposed limits on his use of Facebook. But even that wasn't enough. In August, the 34-year-old tech executive took a more radical step to restrict his use of social media and other addictive technologies.

Rosenstein purchased a new iPhone and instructed his assistant to set up a parental-control feature to prevent him from downloading any apps. He was particularly aware of the allure of Facebook "likes", which he describes as "bright dings of pseudo-pleasure" that can be as hollow as they are seductive. And Rosenstein should know: he was the Facebook engineer who created the "like" button in the first place.

A decade after he stayed up all night coding a prototype of what was then called an "awesome" button, Rosenstein belongs to a small but growing band of Silicon Valley heretics who complain about the rise of the so-called "attention economy": an internet shaped around the demands of an advertising economy. These refuseniks are rarely founders or chief executives, who have little incentive to deviate from the mantra that their companies are making the world a better place. Instead, they tend to have worked a rung or two down the corporate ladder: designers, engineers and product managers who, like Rosenstein, several years ago put in place the building blocks of a digital world from which they are now trying to disentangle themselves. "It is very common," Rosenstein says, "for humans to develop things with the best of intentions and for them to have unintended, negative consequences." Rosenstein, who also helped create Gchat during a stint at Google, and now leads a San Francisco-based company that improves office productivity, appears most concerned about the psychological effects on people who, research shows, touch, swipe or tap their phone 2,617 times a day.

There is growing concern that as well as addicting users, technology is contributing toward so-called "continuous partial attention", severely limiting people's ability to focus, and possibly lowering IQ. One recent study showed that the mere presence of smartphones damages cognitive capacity – even when the device is turned off. "Everyone is distracted," Rosenstein says. "All of the time."

But those concerns are trivial compared with the devastating impact upon the political system that some of Rosenstein's peers believe can be attributed to the rise of social media and the attention-based market that drives it.

Drawing a straight line between addiction to social media and political earthquakes like Brexit and the rise of Donald Trump, they contend that digital forces

have completely upended the political system and, left unchecked, could even render democracy as we know it obsolete.

In 2007, Rosenstein was one of a small group of Facebook employees who decided to create a path of least resistance – a single click – to “send little bits of positivity” across the platform. Facebook’s “like” feature was, Rosenstein says, “wildly” successful: engagement soared as people enjoyed the short-term boost they got from giving or receiving social affirmation, while Facebook harvested valuable data about the preferences of users that could be sold to advertisers. The idea was soon copied by Twitter, with its heart-shaped “likes” (previously star-shaped “favourites”), Instagram, and countless other apps and websites.

It was Rosenstein’s colleague, Leah Pearlman, then a product manager at Facebook and on the team that created the Facebook “like”, who announced the feature in a 2009 blogpost. Now 35 and an illustrator, Pearlman confirmed via email that she, too, has grown disaffected with Facebook “likes” and other addictive feedback loops. She has installed a web browser plug-in to eradicate her Facebook news feed, and hired a social media manager to monitor her Facebook page so that she doesn’t have to.

“One reason I think it is particularly important for us to talk about this now is that we may be the last generation that can remember life before,” Rosenstein says. It may or may not be relevant that Rosenstein, Pearlman and most of the tech insiders questioning today’s attention economy are in their 30s, members of the last generation that can remember a world in which telephones were plugged into walls. It is revealing that many of these younger technologists are weaning themselves off their own products, sending their children to elite Silicon Valley schools where iPhones, iPads and even laptops are banned. They appear to be abiding by a Biggie Smalls lyric from their own youth about the perils of dealing crack cocaine: never get high on your own supply.

One morning in April this year, designers, programmers and tech entrepreneurs from across the world gathered at a conference centre on the shore of the San Francisco Bay. They had each paid up to \$1,700 to learn how to manipulate people into habitual use of their products, on a course curated by conference organiser Nir Eyal. Eyal, 39, the author of *Hooked: How to Build Habit-Forming Products*, has spent several years consulting for the tech industry, teaching techniques he developed by closely studying how the Silicon Valley giants operate.

“The technologies we use have turned into compulsions, if not full-fledged addictions,” Eyal writes. “It’s the impulse to check a message notification. It’s the pull to visit YouTube, Facebook, or Twitter for just a few minutes, only to find yourself still tapping and scrolling an hour later.” None of this is an accident, he writes. It is all “just as their designers intended”.

He explains the subtle psychological tricks that can be used to make people develop habits, such as varying the rewards people receive to create “a craving”, or exploiting negative emotions that can act as “triggers”. “Feelings of boredom, loneliness, frustration, confusion and indecisiveness often instigate a slight pain or

irritation and prompt an almost instantaneous and often mindless action to quell the negative sensation,” Eyal writes.

Attendees of the 2017 Habit Summit might have been surprised when Eyal walked on stage to announce that this year’s keynote speech was about “something a little different”. He wanted to address the growing concern that technological manipulation was somehow harmful or immoral. He told his audience that they should be careful not to abuse persuasive design, and wary of crossing a line into coercion.

But he was defensive of the techniques he teaches, and dismissive of those who compare tech addiction to drugs. “We’re not freebasing Facebook and injecting Instagram here,” he said. He flashed up a slide of a shelf filled with sugary baked goods. “Just as we shouldn’t blame the baker for making such delicious treats, we can’t blame tech makers for making their products so good we want to use them,” he said. “Of course that’s what tech companies will do. And frankly: do we want it any other way?”

Without irony, Eyal finished his talk with some personal tips for resisting the lure of technology. He told his audience he uses a Chrome extension, called DF YouTube, “which scrubs out a lot of those external triggers” he writes about in his book, and recommended an app called Pocket Points that “rewards you for staying off your phone when you need to focus”. Finally, Eyal confided the lengths he goes to protect his own family. He has installed in his house an outlet timer connected to a router that cuts off access to the internet at a set time every day. “The idea is to remember that we are not powerless,” he said. “We are in control.”

But are we? If the people who built these technologies are taking such radical steps to wean themselves free, can the rest of us reasonably be expected to exercise our free will?

Not according to Tristan Harris, a 33-year-old former Google employee turned vocal critic of the tech industry. “All of us are jacked into this system,” he says. “All of our minds can be hijacked. Our choices are not as free as we think they are.” Harris, who has been branded “the closest thing Silicon Valley has to a conscience”, insists that billions of people have little choice over whether they use these now ubiquitous technologies, and are largely unaware of the invisible ways in which a small number of people in Silicon Valley are shaping their lives.

A graduate of Stanford University, Harris studied under BJ Fogg, a behavioural psychologist revered in tech circles for mastering the ways technological design can be used to persuade people. Many of his students, including Eyal, have gone on to prosperous careers in Silicon Valley.

Harris is the student who went rogue; a whistleblower of sorts, he is lifting the curtain on the vast powers accumulated by technology companies and the ways they are using that influence. “A handful of people, working at a handful of technology companies, through their choices will steer what a billion people are thinking today,” he said at a recent TED talk in Vancouver.

“I don’t know a more urgent problem than this,” Harris says. “It’s changing our democracy, and it’s changing our ability to have the conversations and relationships that we want with each other.” Harris went public – giving talks, writing papers, meeting lawmakers and campaigning for reform after three years struggling to effect change inside Google’s Mountain View headquarters.

It all began in 2013, when he was working as a product manager at Google, and circulated a thought-provoking memo, *A Call To Minimise Distraction & Respect Users’ Attention*, to 10 close colleagues. It struck a chord, spreading to some 5,000 Google employees, including senior executives who rewarded Harris with an impressive-sounding new job: he was to be Google’s in-house design ethicist and product philosopher.

Looking back, Harris sees that he was promoted into a marginal role. “I didn’t have a social support structure at all,” he says. Still, he adds: “I got to sit in a corner and think and read and understand.”

He explored how LinkedIn exploits a need for social reciprocity to widen its network; how YouTube and Netflix autoplay videos and next episodes, depriving users of a choice about whether or not they want to keep watching; how Snapchat created its addictive Snapstreaks feature, encouraging near-constant communication between its mostly teenage users.

The techniques these companies use are not always generic: they can be algorithmically tailored to each person. An internal Facebook report leaked this year, for example, revealed that the company can identify when teens feel “insecure”, “worthless” and “need a confidence boost”. Such granular information, Harris adds, is “a perfect model of what buttons you can push in a particular person”.

Tech companies can exploit such vulnerabilities to keep people hooked; manipulating, for example, when people receive “likes” for their posts, ensuring they arrive when an individual is likely to feel vulnerable, or in need of approval, or maybe just bored. And the very same techniques can be sold to the highest bidder. “There’s no ethics,” he says. A company paying Facebook to use its levers of persuasion could be a car business targeting tailored advertisements to different types of users who want a new vehicle. Or it could be a Moscow-based troll farm seeking to turn voters in a swing county in Wisconsin.

Harris believes that tech companies never deliberately set out to make their products addictive. They were responding to the incentives of an advertising economy, experimenting with techniques that might capture people’s attention, even stumbling across highly effective design by accident.

A friend at Facebook told Harris that designers initially decided the notification icon, which alerts people to new activity such as “friend requests” or “likes”, should be blue. It fit Facebook’s style and, the thinking went, would appear “subtle and innocuous”. “But no one used it,” Harris says. “Then they switched it to red and of course everyone used it.”

That red icon is now everywhere. When smartphone users glance at their phones, dozens or hundreds of times a day, they are confronted with small red dots beside their apps, pleading to be tapped. “Red is a trigger colour,” Harris says. “That’s why it is used as an alarm signal.”

The most seductive design, Harris explains, exploits the same psychological susceptibility that makes gambling so compulsive: variable rewards. When we tap those apps with red icons, we don’t know whether we’ll discover an interesting email, an avalanche of “likes”, or nothing at all. It is the possibility of disappointment that makes it so compulsive.

It’s this that explains how the pull-to-refresh mechanism, whereby users swipe down, pause and wait to see what content appears, rapidly became one of the most addictive and ubiquitous design features in modern technology. “Each time you’re swiping down, it’s like a slot machine,” Harris says. “You don’t know what’s coming next. Sometimes it’s a beautiful photo. Sometimes it’s just an ad.”

The designer who created the pull-to-refresh mechanism, first used to update Twitter feeds, is Loren Brichter, widely admired in the app-building community for his sleek and intuitive designs.

Now 32, Brichter says he never intended the design to be addictive – but would not dispute the slot machine comparison. “I agree 100%,” he says. “I have two kids now and I regret every minute that I’m not paying attention to them because my smartphone has sucked me in.”

Brichter created the feature in 2009 for Tweetie, his startup, mainly because he could not find anywhere to fit the “refresh” button on his app. Holding and dragging down the feed to update seemed at the time nothing more than a “cute and clever” fix. Twitter acquired Tweetie the following year, integrating pull-to-refresh into its own app.

Since then the design has become one of the most widely emulated features in apps; the downward-pull action is, for hundreds of millions of people, as intuitive as scratching an itch.

Brichter says he is puzzled by the longevity of the feature. In an era of push notification technology, apps can automatically update content without being nudged by the user. “It could easily retire,” he says. Instead it appears to serve a psychological function: after all, slot machines would be far less addictive if gamblers didn’t get to pull the lever themselves. Brichter prefers another comparison: that it is like the redundant “close door” button in some elevators with automatically closing doors. “People just like to push it.”

All of which has left Brichter, who has put his design work on the backburner while he focuses on building a house in New Jersey, questioning his legacy. “I’ve spent many hours and weeks and months and years thinking about whether anything I’ve done has made a net positive impact on society or humanity at all,” he says. He has blocked certain websites, turned off push notifications, restricted his use of the Telegram app to message only with his wife and two close friends, and tried to wean himself off Twitter. “I still waste time on it,” he confesses, “just reading stupid news

I already know about.” He charges his phone in the kitchen, plugging it in at 7pm and not touching it until the next morning.

“Smartphones are useful tools,” he says. “But they’re addictive. Pull-to-refresh is addictive. Twitter is addictive. These are not good things. When I was working on them, it was not something I was mature enough to think about. I’m not saying I’m mature now, but I’m a little bit more mature, and I regret the downsides.”

Not everyone in his field appears racked with guilt. The two inventors listed on Apple’s patent for “managing notification connections and displaying icon badges” are Justin Santamaria and Chris Marcellino. Both were in their early 20s when they were hired by Apple to work on the iPhone. As engineers, they worked on the behind-the-scenes plumbing for push-notification technology, introduced in 2009 to enable real-time alerts and updates to hundreds of thousands of third-party app developers. It was a revolutionary change, providing the infrastructure for so many experiences that now form a part of people’s daily lives, from ordering an Uber to making a Skype call to receiving breaking news updates.

But notification technology also enabled a hundred unsolicited interruptions into millions of lives, accelerating the arms race for people’s attention. Santamaria, 36, who now runs a startup after a stint as the head of mobile at Airbnb, says the technology he developed at Apple was not “inherently good or bad”. “This is a larger discussion for society,” he says. “Is it OK to shut off my phone when I leave work? Is it OK if I don’t get right back to you? Is it OK that I’m not ‘liking’ everything that goes through my Instagram screen?”

His then colleague, Marcellino, agrees. “Honestly, at no point was I sitting there thinking: let’s hook people,” he says. “It was all about the positives: these apps connect people, they have all these uses – ESPN telling you the game has ended, or WhatsApp giving you a message for free from your family member in Iran who doesn’t have a message plan.”

A few years ago Marcellino, 33, left the Bay Area, and is now in the final stages of retraining to be a neurosurgeon. He stresses he is no expert on addiction, but says he has picked up enough in his medical training to know that technologies can affect the same neurological pathways as gambling and drug use. “These are the same circuits that make people seek out food, comfort, heat, sex,” he says.

All of it, he says, is reward-based behaviour that activates the brain’s dopamine pathways. He sometimes finds himself clicking on the red icons beside his apps “to make them go away”, but is conflicted about the ethics of exploiting people’s psychological vulnerabilities. “It is not inherently evil to bring people back to your product,” he says. “It’s capitalism.”

That, perhaps, is the problem. Roger McNamee, a venture capitalist who benefited from hugely profitable investments in Google and Facebook, has grown disenchanted with both companies, arguing that their early missions have been distorted by the fortunes they have been able to earn through advertising.

He identifies the advent of the smartphone as a turning point, raising the stakes in an arms race for people’s attention. “Facebook and Google assert with merit that

they are giving users what they want,” McNamee says. “The same can be said about tobacco companies and drug dealers.”

That would be a remarkable assertion for any early investor in Silicon Valley’s most profitable behemoths. But McNamee, 61, is more than an arms-length money man. Once an adviser to Mark Zuckerberg, 10 years ago McNamee introduced the Facebook CEO to his friend, Sheryl Sandberg, then a Google executive who had overseen the company’s advertising efforts. Sandberg, of course, became chief operating officer at Facebook, transforming the social network into another advertising heavyweight.

McNamee chooses his words carefully. “The people who run Facebook and Google are good people, whose well-intentioned strategies have led to horrific unintended consequences,” he says. “The problem is that there is nothing the companies can do to address the harm unless they abandon their current advertising models.”

But how can Google and Facebook be forced to abandon the business models that have transformed them into two of the most profitable companies on the planet? McNamee believes the companies he invested in should be subjected to greater regulation, including new anti-monopoly rules. In Washington, there is growing appetite, on both sides of the political divide, to rein in Silicon Valley. But McNamee worries the behemoths he helped build may already be too big to curtail. “The EU recently penalised Google \$2.42bn for anti-monopoly violations, and Google’s shareholders just shrugged,” he says.

Rosenstein, the Facebook “like” co-creator, believes there may be a case for state regulation of “psychologically manipulative advertising”, saying the moral impetus is comparable to taking action against fossil fuel or tobacco companies. “If we only care about profit maximisation,” he says, “we will go rapidly into dystopia.”

James Williams does not believe talk of dystopia is far-fetched. The ex-Google strategist who built the metrics system for the company’s global search advertising business, he has had a front-row view of an industry he describes as the “largest, most standardised and most centralised form of attentional control in human history”.

Williams, 35, left Google last year, and is on the cusp of completing a PhD at Oxford University exploring the ethics of persuasive design. It is a journey that has led him to question whether democracy can survive the new technological age.

He says his epiphany came a few years ago, when he noticed he was surrounded by technology that was inhibiting him from concentrating on the things he wanted to focus on. “It was that kind of individual, existential realisation: what’s going on?” he says. “Isn’t technology supposed to be doing the complete opposite of this?”

That discomfort was compounded during a moment at work, when he glanced at one of Google’s dashboards, a multicoloured display showing how much of people’s attention the company had commandeered for advertisers. “I realised: this is literally a million people that we’ve sort of nudged or persuaded to do this thing that they weren’t going to otherwise do,” he recalls.

He embarked on several years of independent research, much of it conducted while working part-time at Google. About 18 months in, he saw the Google memo circulated by Harris and the pair became allies, struggling to bring about change from within.

Williams and Harris left Google around the same time, and co-founded an advocacy group, Time Well Spent, that seeks to build public momentum for a change in the way big tech companies think about design. Williams finds it hard to comprehend why this issue is not “on the front page of every newspaper every day. “Eighty-seven percent of people wake up and go to sleep with their smartphones,” he says. The entire world now has a new prism through which to understand politics, and Williams worries the consequences are profound.

The same forces that led tech firms to hook users with design tricks, he says, also encourage those companies to depict the world in a way that makes for compulsive, irresistible viewing. “The attention economy incentivises the design of technologies that grab our attention,” he says. “In so doing, it privileges our impulses over our intentions.”

That means privileging what is sensational over what is nuanced, appealing to emotion, anger and outrage. The news media is increasingly working in service to tech companies, Williams adds, and must play by the rules of the attention economy to “sensationalise, bait and entertain in order to survive”.

In the wake of Donald Trump’s stunning electoral victory, many were quick to question the role of so-called “fake news” on Facebook, Russian-created Twitter bots or the data-centric targeting efforts that companies such as Cambridge Analytica used to sway voters. But Williams sees those factors as symptoms of a deeper problem.

It is not just shady or bad actors who were exploiting the internet to change public opinion. The attention economy itself is set up to promote a phenomenon like Trump, who is masterly at grabbing and retaining the attention of supporters and critics alike, often by exploiting or creating outrage.

Williams was making this case before the president was elected. In a blog published a month before the US election, Williams sounded the alarm bell on an issue he argued was a “far more consequential question” than whether Trump reached the White House. The reality TV star’s campaign, he said, had heralded a watershed in which “the new, digitally supercharged dynamics of the attention economy have finally crossed a threshold and become manifest in the political realm”.

Williams saw a similar dynamic unfold months earlier, during the Brexit campaign, when the attention economy appeared to him biased in favour of the emotional, identity-based case for the UK leaving the European Union. He stresses these dynamics are by no means isolated to the political right: they also play a role, he believes, in the unexpected popularity of leftwing politicians such as Bernie Sanders and Jeremy Corbyn, and the frequent outbreaks of internet outrage over issues that ignite fury among progressives.

All of which, Williams says, is not only distorting the way we view politics but, over time, may be changing the way we think, making us less rational and more

impulsive. “We’ve habituated ourselves into a perpetual cognitive style of outrage, by internalising the dynamics of the medium,” he says.

It is against this political backdrop that Williams argues the fixation in recent years with the surveillance state fictionalised by George Orwell may have been misplaced. It was another English science fiction writer, Aldous Huxley, who provided the more prescient observation when he warned that Orwellian-style coercion was less of a threat to democracy than the more subtle power of psychological manipulation, and “man’s almost infinite appetite for distractions”.

Since the US election, Williams has explored another dimension to today’s brave new world. If the attention economy erodes our ability to remember, to reason, to make decisions for ourselves – faculties that are essential to self-governance – what hope is there for democracy itself?

“The dynamics of the attention economy are structurally set up to undermine the human will,” he says. “If politics is an expression of our human will, on individual and collective levels, then the attention economy is directly undermining the assumptions that democracy rests on.” If Apple, Facebook, Google, Twitter, Instagram and Snapchat are gradually chipping away at our ability to control our own minds, could there come a point, I ask, at which democracy no longer functions? “Will we be able to recognise it, if and when it happens?” Williams replies. “And if we can’t, then how do we know it hasn’t happened already?”

Adapted from the Guardian

THE YOUNG AND THE RECKLESS

A gang of teen hackers snatched the keys to Microsoft's videogame empire. Then they went too far.

I. THE BUMPER

THE TRIP TO Delaware was only supposed to last a day. David Pokora, a bespectacled University of Toronto senior with scraggly blond hair down to his shoulders, needed to travel south to fetch a bumper that he’d bought for his souped-up Volkswagen Golf R.

The American seller had balked at shipping to Canada, so Pokora arranged to have the part sent to a buddy, Justin May, who lived in Wilmington. The young men, both ardent gamers, shared a fascination with the inner workings of the Xbox; though they’d been chatting and collaborating for years, they’d never met in person. Pokora planned to make the eight-hour drive on a Friday, grab a leisurely dinner with May, then haul the metallic-blue bumper back home to Mississauga, Ontario, that night or early the next morning. His father offered to tag along so they could take turns behind the wheel of the family’s Jetta.

An hour into their journey on March 28, 2014, the Pokoras crossed the Lewiston–Queenston Bridge and hit the border checkpoint on the eastern side of the Niagara Gorge. An American customs agent gently quizzed them about their itinerary as he scanned their passports in his booth. He seemed ready to wave the Jetta through when something on his monitor caught his eye.

“What’s ... Xenon?” the agent asked, stumbling over the pronunciation of the word. David, who was in the passenger seat, was startled by the question. Xenon was one of his online aliases, a pseudonym he often used—along with Xenomega and DeToX—when playing Halo or discussing his Xbox hacking projects with fellow programmers. Why would that nickname, familiar to only a handful of gaming fanatics, pop up when his passport was checked?

Pokora’s puzzlement lasted a few moments before he remembered that he’d named his one-man corporation Xenon Development Studios; the business processed payments for the Xbox service he operated that gave monthly subscribers the ability to unlock achievements or skip levels in more than 100 different games. He mentioned the company to the customs agent, making sure to emphasize that it was legally registered. The agent instructed the Pokoras to sit tight for just a minute longer.

As he and his father waited for permission to enter western New York, David detected a flutter of motion behind the idling Jetta. He glanced back and saw two men in dark uniforms approaching the car, one on either side. “Something’s wrong,” his father said, an instant before a figure appeared outside the passenger-side window. As a voice barked at him to step out of the vehicle, Pokora realized he’d walked into a trap.

In the detention area of the adjoining US Customs and Border Protection building, an antiseptic room with a lone metal bench, Pokora pondered all the foolish risks he’d taken while in thrall to his Xbox obsession. When he’d started picking apart the console’s software a decade earlier, it had seemed like harmless fun—a way for him and his friends to match wits with the corporate engineers whose ranks they yearned to join. But the Xbox hacking scene had turned sordid over time, its ethical norms corroded by the allure of money, thrills, and status. And Pokora had gradually become enmeshed in a series of schemes that would have alarmed his younger self: infiltrating game developers’ networks, counterfeiting an Xbox prototype, even abetting a burglary on Microsoft’s main campus.

Pokora had long been aware that his misdeeds had angered some powerful interests, and not just within the gaming industry; in the course of seeking out all things Xbox, he and his associates had wormed into American military networks too. But in those early hours after his arrest, Pokora had no clue just how much legal wrath he’d brought upon his head: For eight months he’d been under sealed indictment for conspiring to steal as much as \$1 billion worth of intellectual property, and federal prosecutors were intent on making him the first foreign hacker to be convicted for the theft of American trade secrets. Several of his friends and colleagues would end up being pulled into the vortex of trouble he’d helped create; one would become an informant, one would become a fugitive, and one would end up dead.

Pokora could see his father sitting in a room outside the holding cell, on the other side of a thick glass partition. He watched as a federal agent leaned down to inform the elder Pokora, a Polish-born construction worker, that his only son

wouldn't be returning to Canada for a very long time; his father responded by burying his head in his calloused hands.

Gutted to have caused the usually stoic man such anguish, David wished he could offer some words of comfort. "It's going to be OK, dad," he said in a soft voice, gesturing to get his attention. "It's going to be OK." But his father couldn't hear him through the glass.

II. KINDERGARTEN SECURITY MISTAKES

WELL BEFORE HE could read or write, David Pokora mastered the intricacies of first-person shooters. There is a grainy video of him playing *Blake Stone: Aliens of Gold* in 1995, his 3-year-old fingers nimbly dancing around the keyboard of his parents' off-brand PC. What captivated him about the game was not its violence but rather the seeming magic of its controls; he wondered how a boxy beige machine could convert his physical actions into onscreen motion. The kid was a born programmer.

Pokora dabbled in coding throughout elementary school, building tools like basic web browsers. But he became wholly enamored with the craft as a preteen on a family trip to Poland. He had lugged his bulky laptop to the sleepy town where his parents' relatives lived. There was little else to do, so as chickens roamed the yards he passed the time by teaching himself the Visual Basic .NET programming language. The house where he stayed had no internet access, so Pokora couldn't Google for help when his programs spit out errors. But he kept chipping away at his code until it was immaculate, a labor-intensive process that filled him with unexpected joy. By the time he got back home, he was hooked on the psychological rewards of bending machines to his will.

As Pokora began to immerse himself in programming, his family bought its first Xbox. With its ability to connect to multiplayer sessions on the Xbox Live service and its familiar -Windows-derived architecture, the machine made Pokora's Super Nintendo seem like a relic. Whenever he wasn't splattering aliens in *Halo*, Pokora scoured the internet for technical information about his new favorite plaything. His wanderings brought him into contact with a community of hackers who were redefining what the Xbox could do.

To divine its secrets, these hackers had cracked open the console's case and eavesdropped on the data that zipped between the motherboard's various components—the CPU, the RAM, the Flash chip. This led to the discovery of what the cryptography expert Bruce Schneier termed "lots of kindergarten security mistakes." For example, Microsoft had left the decryption key for the machine's boot code lying around in an accessible area of the machine's memory. When an MIT graduate student named Bunnie Huang located that key in 2002, he gave his hacker compatriots the power to trick the Xbox into booting up homebrew programs that could stream music, run Linux, or emulate Segas and Nintendos. All they had to do first was tweak their consoles' firmware, either by soldering a so-called modchip onto the motherboard or loading a hacked game-save file from a USB drive.

Once Pokora hacked his family's Xbox, he got heavy into tinkering with his cherished Halo. He haunted IRC channels and web forums where the best Halo programmers hung out, poring over tutorials on how to alter the physics of the game. He was soon making a name for himself by writing Halo 2 utilities that allowed players to fill any of the game's landscapes with digitized water or change blue skies into rain.

The hacking free-for-all ended with the release of the second-generation Xbox, the Xbox 360, in November 2005. The 360 had none of the glaring security flaws of its predecessor, to the chagrin of programmers like the 13-year-old Pokora who could no longer run code that hadn't been approved by Microsoft. There was one potential workaround for frustrated hackers, but it required a rare piece of hardware: an Xbox 360 development kit.

Dev kits are the machines that Microsoft-approved developers use to write Xbox content. To the untrained eye they look like ordinary consoles, but the units contain most of the software integral to the game development process, including tools for line-by-line debugging. A hacker with a dev kit can manipulate Xbox software just like an authorized programmer.

Microsoft sends dev kits only to rigorously screened game-development companies. In the mid-2000s a few kits would occasionally become available when a bankrupt developer dumped its assets in haste, but for the most part the hardware was seldom spotted in the wild. There was one hacker, however, who lucked into a mother lode of 360 dev kits and whose eagerness to profit off his good fortune would help Pokora ascend to the top of the Xbox scene.

III. THE ONLY EDUCATION THAT MATTERED

IN 2006, WHILE working as a Wells Fargo technology manager in Walnut Creek, California, 38-year-old Rowdy Van Cleave learned that a nearby recycling facility was selling Xbox DVD drives cheap. When he went to inspect the merchandise, the facility's owners mentioned they received regular deliveries of surplus Microsoft hardware. Van Cleave, who'd been part of a revered Xbox-hacking crew called Team Avalaunch, volunteered to poke around the recyclers' warehouse and point out any Xbox junk that might have resale value.

After sifting through mountains of Xbox flotsam and jetsam, Van Cleave talked the recyclers into letting him take home five motherboards. When he jacked one of them into his Xbox 360 and booted it up, the screen gave him the option to activate debugging mode. "Holy shit," Van Cleave thought, "this is a frickin' dev motherboard!"

Aware that he had stumbled on the Xbox scene's equivalent of King Tut's tomb, Van Cleave cut a deal with the recyclers that let him buy whatever discarded Xbox hardware came their way. Some of these treasures he kept for his own sizable collection or handed out to friends; he once gave another Team Avalaunch member a dev kit as a wedding present. But Van Cleave was always on the lookout for paying customers he could trust to be discreet.

The 16-year-old Pokora became one of those customers in 2008, shortly after meeting Van Cleave through an online friend and impressing him with his technical prowess. In addition to buying kits for himself, Pokora acted as a salesman for Van Cleave, peddling hardware at significant markup to other Halo hackers; he charged around \$1,000 per kit, though desperate souls sometimes ponied up as much as \$3,000. (Van Cleave denies that Pokora sold kits on his behalf.) He befriended several of his customers, including a guy named Justin May who lived in Wilmington, Delaware.

Now flush with dev kits, Pokora was able to start modifying the recently released Halo 3. He kept vampire hours as he hacked, coding in a trancelike state that he termed “hyperfocus” until he dropped from exhaustion at around 3 or 4 am. He was often late for school, but he shrugged off his slumping grades; he considered programming on his dev kit to be the only education that mattered.

Pokora posted snippets of his Halo 3 work on forums like Halomods.com, which is how he came to the attention of a hacker in Whittier, California, named Anthony Clark. The 18-year-old Clark had experience disassembling Xbox games—reverse-engineering their code from machine language into a programming language. He reached out to Pokora and proposed that they join forces on some projects.

Clark and Pokora grew close, talking nearly every day about programming as well as music, cars, and other adolescent fixations. Pokora sold Clark a dev kit so they could hack Halo 3 in tandem; Clark, in turn, gave Pokora tips on the art of the disassembly. They cowrote a Halo 3 tool that let them endow the protagonist, Master Chief, with special skills—like the ability to jump into the clouds or fire weird projectiles. And they logged countless hours playing their hacked creations on PartnerNet, a sandbox version of Xbox Live available only to dev kit owners.

As they released bits and pieces of their software online, Pokora and Clark began to hear from engineers at Microsoft and Bungie, the developer behind the Halo series. The professional programmers offered nothing but praise, despite knowing that Pokora and Clark were using ill-gotten dev kits. Cool, you did a good job of reverse-engineering this, they’d tell Pokora. The encouraging feedback convinced him that he was on an unorthodox path to a career in game development—perhaps the only path available to a construction worker’s son from Mississauga who was no classroom star.

But Pokora and Clark occasionally flirted with darker hijinks. By 2009 the pair was using PartnerNet not only to play their modded versions of Halo 3 but also to swipe unreleased software that was still being tested. There was one Halo 3 map that Pokora snapped a picture of and then shared too liberally with friends; the screenshot wound up getting passed around among Halo fans. When Pokora and Clark next returned to PartnerNet to play Halo 3, they encountered a message on the game’s main screen that Bungie engineers had expressly left for them: “Winners Don’t Break Into PartnerNet.”

The two hackers laughed off the warning. They considered their mischief all in good fun—they’d steal a beta here and there, but only because they loved the Xbox

so much, not to enrich themselves. They saw no reason to stop playing cat and mouse with the Xbox pros, whom they hoped to call coworkers some day.

IV. I MEAN, IT'S JUST VIDEOGAMES

THE XBOX 360 remained largely invulnerable until late 2009, when security researchers finally identified a weakness: By affixing a modchip to an arcane set of motherboard pins used for quality-assurance testing, they managed to nullify the 360's defenses. The hack came to be known as the JTAG, after the Joint Test Action Group, the industry body that had recommended adding the pins to all printed circuit boards in the mid-1980s.

When news of the vulnerability broke, Xbox 360 owners rushed to get their consoles JTAGged by services that materialized overnight. With 23 million subscribers now on Xbox Live, multiplayer gaming had become vastly more competitive, and a throng of gamers whom Pokora dubbed "spoiled kids with their parents' credit cards" were willing to go to extraordinary lengths to humiliate their rivals.

For Pokora and Clark, it was an opportunity to cash in. They hacked the Call of Duty series of military-themed shooters to create so-called modded lobbies—places on Xbox Live where Call of Duty players could join games governed by reality-bending rules. For fees that ranged up to \$100 per half-hour, players with JTAGged consoles could participate in death matches while wielding superpowers: They could fly, walk through walls, sprint with Flash-like speed, or shoot bullets that never missed their targets.

For an extra \$50 to \$150, Pokora and Clark also offered "infections"—powers that players' characters would retain when they joined nonhacked games. Pokora was initially reluctant to sell infections: He knew his turbocharged clients would slaughter their hapless opponents, a situation that struck him as contrary to the spirit of gaming. But then the money started rolling in—as much as \$8,000 on busy days. There were so many customers that he and Clark had to hire employees to deal with the madness. Swept up in the excitement of becoming an entrepreneur, Pokora forgot all about his commitment to fairness. It was one more step down a ladder he barely noticed he was descending.

Microsoft tried to squelch breaches like the Call of Duty cheats by launching an automated system that could detect JTAGged consoles and ban them. But Pokora reverse-engineered the system and devised a way to beat it: He wrote a program that hijacked Xbox Live's security queries to an area of the console where they could be filled with false data, and thus be duped into certifying a hacked console.

Pokora reveled in the perks of his success. He still lived with his parents, but he paid his tuition as he entered the University of Toronto in the fall of 2010. He and his girlfriend dined at upscale restaurants every night and stayed at \$400-a-night hotels as they traveled around Canada for metal shows. But he wasn't really in it for the money or even the adulation of his peers; what he most coveted was the sense of glee and power he derived from making \$60 million games behave however he wished.

Pokora knew there was a whiff of the illegal about his Call of Duty business, which violated numerous copyrights. But he interpreted the lack of meaningful pushback from either Microsoft or Activision, Call of Duty's developer, as a sign that the companies would tolerate his enterprise, much as Bungie had put up with his Halo 3 shenanigans. Activision did send a series of cease-and-desist letters, but the company never followed through on its threats.

"I mean, it's just videogames," Pokora told himself whenever another Activision letter arrived. "It's not like we're hacking into a server or stealing anyone's information." That would come soon enough.

V. TUNNELS

DYLAN WHEELER, A hacker in Perth, Australia, whose alias was SuperDaE, knew that something juicy had fallen into his lap. An American friend of his who went by the name Gamerfreak had slipped him a password list for the public forums operated by Epic Games, a Cary, North Carolina, game developer known for its Unreal and Gears of War series. In 2010 Wheeler started poking around the forums' accounts to see if any of them belonged to Epic employees. He eventually identified a member of the company's IT department whose employee email address and password appeared on Gamerfreak's list; rummaging through the man's personal emails, Wheeler found a password for an internal EpicGames.com account.

Once he had a toehold at Epic, Wheeler wanted a talented partner to help him sally deeper into the network. "Who is big enough to be interested in something like this?" he wondered. Xenomega—David Pokora—whom he'd long admired from afar and was eager to befriend, was the first name that popped to mind. Wheeler cold-messaged the Canadian and offered him the chance to get inside one of the world's preeminent game developers; he didn't mention that he was only 14, fearing that his age would be a deal breaker.

What Wheeler was proposing was substantially shadier than anything Pokora had attempted before: It was one thing to download Halo maps from the semipublic PartnerNet and quite another to break into a fortified private network where a company stores its most sensitive data. But Pokora was overwhelmed by curiosity about what software he might unearth on Epic's servers and titillated by the prospect of reverse-engineering a trove of top-secret games. And so he rationalized what he was about to do by setting ground rules—he wouldn't take any credit card numbers, for example, nor peek at personal information about Epic's customers.

Pokora and Wheeler combed through Epic's network by masquerading as the IT worker whose login credentials Wheeler had compromised. They located a plugged-in USB drive that held all of the company's passwords, including one that gave them root access to the entire network. Then they pried into the computers of Epic bigwigs such as design director Cliff "CliffyB" Bleszinski; the pair chortled when they opened a music folder that Bleszinski had made for his Lamborghini and saw that it contained lots of Katy Perry and Miley Cyrus tunes. (Bleszinski, who left Epic in 2012, confirms the hackers' account, adding that he's "always been public and forthright about my taste for bubblegum pop.")

To exfiltrate Epic's data, Wheeler enlisted the help of Sanadodeh "Sonic" Nesheiwat, a New Jersey gamer who possessed a hacked cable modem that could obfuscate its location. In June 2011 Nesheiwat downloaded a prerelease copy of Gears of War 3 from Epic, along with hundreds of gigabytes of other software. He burned Epic's source code onto eight Blu-ray discs that he shipped to Pokora in a package marked wedding videos. Pokora shared the game with several friends, including his dev kit customer Justin May; within days a copy showed up on the Pirate Bay, a notorious BitTorrent site.

The Gears of War 3 leak triggered a federal investigation, and Epic began working with the FBI to determine how its security had been breached. Pokora and Wheeler found out about the nascent probe while reading Epic's emails; they freaked out when one of those emails described a meeting between the company's brain trust and FBI agents. "I need your help—I'm going to get arrested," a panicked Pokora wrote to May that July. "I need to encrypt some hard drives."

But the email chatter between Epic and the FBI quickly died down, and the company made no apparent effort to block the hackers' root access to the network—a sign that it couldn't pinpoint their means of entry. Having survived their first brush with the law, the hackers felt emboldened—the brazen Wheeler most of all. He kept trespassing on sensitive areas of Epic's network, making few efforts to conceal his IP address as he spied on high-level corporate meetings through webcams he'd commandeered. "He knowingly logs into Epic knowing that the feds chill there," Nesheiwat told Pokora about their Australian partner. "They were emailing FBI people, but he still manages to not care."

Owning Epic's network gave the hackers entrée to a slew of other organizations. Pokora and Wheeler came across login credentials for Scaleform, a so-called middleware company that provided technology for the engine at the heart of Epic's games. Once they'd broken into Scaleform, they discovered that the company's network was full of credentials for Silicon Valley titans, Hollywood entertainment conglomerates, and Zombie Studios, the developer of the Spec Ops series of games. On Zombie's network they uncovered remote-access "tunnels" to its clients, including branches of the American military. Wriggling through those poorly secured tunnels was no great challenge, though Pokora was wary of leaving behind too many digital tracks. "If they notice any of this," he told the group, "they're going to come looking for me."

As the scale of their enterprise increased, the hackers discussed what they should do if the FBI came knocking. High off the feeling of omnipotence that came from burrowing into supposedly impregnable networks, Pokora proposed releasing all of Epic's proprietary data as an act of revenge: "If we ever go disappearing, just, you know, upload it to the internet and say fuck you Epic."

The group also cracked jokes about what they should call their prison gang. Everyone dug Wheeler's tongue-in-cheek suggestion that they could strike fear into other inmates' hearts by dubbing themselves the Xbox Underground.

VI. HOW DO WE END IT?

POKORA WAS BECOMING ever more infatuated with his forays into corporate networks, and his old friends from the Xbox scene feared for his future. Kevin Skitzo, a Team Avalaunch hacker, urged him to pull back from the abyss. “Dude, just stop this shit,” he implored Pokora. “Focus on school, because this shit? I mean, I get it—it’s a high. But as technology progresses and law enforcement gets more aware, you can only dodge that bullet for so long.”

But Pokora was too caught up in the thrill of stockpiling forbidden software to heed this advice. In September 2011 he stole a prerelease copy of Call of Duty: Modern Warfare 3. “Let’s get arrested,” he quipped to his friends as he started the download.

Though he was turning cocky as he swung from network to network without consequence, Pokora still took pride in how little he cared about money. After seizing a database that contained “a fuckton of PayPals,” Pokora sang his own praises to his associates for resisting the temptation to profit off the accounts. “We could already have sold them for Bitcoins which would have been untraceable if we did it right. It could have already been easily an easy fifty grand.”

But with each passing week, Pokora became a little bit more mercenary. In November 2011, for example, he asked his friend May to broker a deal with a gamer who went by Xboxdevguy, who’d expressed an interest in buying prerelease games. Pokora was willing to deliver any titles Xboxdevguy desired for a few hundred dollars each.

Pokora’s close relationship with May made his hacker cohorts uneasy. They knew that May had been arrested at a Boston gaming convention in March 2010 for trying to download the source code for the first-person shooter Breach. A spokesperson for the game’s developer told the tech blog Engadget that, upon being caught after a brief foot chase, May had said he “could give us bigger and more important people and he could ‘name names.’” But Pokora trusted May because he’d watched him participate in many crooked endeavors; he couldn’t imagine that anyone in cahoots with law enforcement would be allowed to do so much dirt.

By the spring of 2012, Pokora and Wheeler were focused on pillaging the network of Zombie Studios. Their crew now included two new faces from the scene: Austin “AAMonkey” Alcalá, an Indiana high school kid, and Nathan “animefre4k” Leroux, the home-schooled son of a diesel mechanic from Bowie, Maryland. Leroux, in particular, was an exceptional talent: He’d cowritten a program that could trick Electronic Arts’ soccer game FIFA 2012 into minting the virtual coins that players get for completing matches, and which are used to buy character upgrades.

While navigating through Zombie’s network, the group stumbled on a tunnel to a US Army server; it contained a simulator for the AH-64D Apache helicopter that Zombie was developing on a Pentagon contract. Ever the wild man, Wheeler downloaded the software and told his colleagues they should “sell the simulators to the Arabs.”

The hackers were also busy tormenting Microsoft, stealing documents that contained specs for an early version of the Durango, the codename for the next-

generation Xbox—a machine that would come to be known as the Xbox One. Rather than sell the documents to a Microsoft competitor, the hackers opted for a more byzantine scheme: They would counterfeit and sell a Durango themselves, using off-the-shelf components. Leroux volunteered to do the assembly in exchange for a cut of the proceeds; he needed money to pay for online computer science classes at the University of Maryland.

The hackers put out feelers around the scene and found a buyer in the Seychelles who was willing to pay \$5,000 for the counterfeit console. May picked up the completed machine from Leroux's house and promised to ship it to the archipelago in the Indian Ocean.

But the Durango never arrived at its destination. When the buyer complained, paranoia set in: Had the FBI intercepted the shipment? Were they now all under surveillance?

Wheeler was especially unsettled: He'd thought the crew was untouchable after the Epic investigation appeared to stall, but now he felt certain that everyone was about to get hammered by a racketeering case. "How do we end this game?" he asked himself. The answer he came up with was to go down in a blaze of glory, to do things that would ensure his place in Xbox lore.

Wheeler launched his campaign for notoriety by posting a Durango for sale on eBay, using photographs of the one that Leroux had built. The bidding for the nonexistent machine reached \$20,100 before eBay canceled the auction, declaring it fraudulent. Infuriated by the media attention the saga generated, Pokora cut off contact with Wheeler.

A few weeks later, Leroux vanished from the scene; rumors swirled that he'd been raided by the FBI. Americans close to Pokora began to tell him they were being tailed by black cars with tinted windows. The hackers suspected there might be an informant in their midst.

VII. PERSON A

THE RELATIONSHIP BETWEEN Pokora and Clark soured as Pokora got deeper into hacking developers. The two finally fell out over staffing issues at their Call of Duty business—for example, they hired some workers whom Pokora considered greedy, but Clark refused to call them out. Sick of dealing with such friction, both men drifted into other ventures. Pokora focused on Horizon, an Xbox cheating service that he built on the side with some friends; he liked that Horizon's cheats couldn't be used on Xbox Live, which meant fewer potential technical and legal headaches. Clark, meanwhile, refined Leroux's FIFA coin-minting technology and started selling the virtual currency on the black market. Austin Alcala, who'd participated in the hack of Zombie Studios and the Xbox One counterfeiting caper, worked for Clark's new venture.

As the now 20-year-old Pokora split his energies between helping to run Horizon and attending university, Wheeler continued his kamikaze quest for attention. In the wake of his eBay stunt, Microsoft sent a private investigator named Miles Hawkes to Perth to confront him. Wheeler posted on Twitter about meeting

“Mr. Microsoft Man,” who pressed him for information about his collaborators over lunch at the Hyatt. According to Wheeler, Hawkes told him not to worry about any legal repercussions, as Microsoft was only interested in going after “real assholes.” (Microsoft denies that Hawkes said this.)

In December 2012 the FBI raided Sanadodeh Nesheiwat’s home in New Jersey. Nesheiwat posted an unredacted version of the search warrant online. Wheeler reacted by doxing the agents in a public forum and encouraging people to harass them; he also spoke openly about hiring a hitman to murder the federal judge who’d signed the warrant.

Wheeler’s bizarre compulsion to escalate every situation alarmed federal prosecutors, who’d been carefully building a case against the hackers since the Gears of War leak in June 2011. Edward McAndrew, the assistant US attorney who was leading the investigation, felt he needed to accelerate the pace of his team’s work before Wheeler sparked real violence.

On the morning of February 19, 2013, Wheeler was working in his family’s home in Perth when he noticed a commotion in the yard below his window. A phalanx of men in light tactical gear was approaching the house, Glocks holstered by their sides. Wheeler scrambled to shut down all of his computers, so that whoever would be dissecting his hardware would at least have to crack his passwords.

Over the next few hours, Australian police carted away what Wheeler estimated to be more than \$20,000 worth of computer equipment; Wheeler was miffed that no one bothered to place his precious hard drives in antistatic bags. He wasn’t jailed that day, but his hard drives yielded a bounty of incriminating evidence: Wheeler had taken frequent screenshots of his hacking exploits, such as a chat in which he proposed running “some crazy program to fuck the fans up” on Zombie Studios’ servers.

That July, Pokora told Justin May he was about to attend Defcon, the annual hacker gathering in Las Vegas—his first trip across the border in years. On July 23, - McAndrew and his colleagues filed a sealed 16-count indictment against Pokora, Nesheiwat, and Leroux, charging them with crimes including wire fraud, identify theft, and conspiracy to steal trade secrets; Wheeler and Gamerfreak, the original source of the Epic password list, were named as unindicted coconspirators. (Alcala would be added as a defendant four months later.) The document revealed that much of the government’s case was built on evidence supplied by an informant referred to as Person A. He was described as a Delaware resident who had picked up the counterfeit Durango from Leroux’s house, then handed it over to the FBI.

Prosecutors also characterized the defendants as members of the “Xbox Underground.” Wheeler’s prison-gang joke was a joke no longer. Though he knew nothing about the secret indictment, Pokora was too busy to go to Defcon and pulled out at the last minute. The FBI worried that arresting his American coconspirators would spur him to go on the lam, so the agency decided to wait for him to journey south before rolling up the crew.

Two months later, Pokora went to the Toronto Opera House for a show by the Swedish metal band Katatonia. His phone buzzed as a warm-up act was tearing through a song—it was Alcalá, now a high school senior in Fishers, Indiana. He was tittering with excitement: He said he knew a guy who could get them both the latest Durango prototypes—real ones, not counterfeits like the machine they'd made the summer before. His connection was willing to break into a building on Microsoft's Redmond campus to steal them. In exchange, the burglar was demanding login credentials for Microsoft's game developer network plus a few thousand dollars. Pokora was baffled by the aspiring burglar's audacity. "This guy's stupid," he thought. But after years of pushing his luck, Pokora was no longer in the habit of listening to his own common sense. He told Alcalá to put them in touch.

The burglar was a recent high school graduate named Arman, known on the scene as ArmanTheCyber. (He agreed to share his story on the condition that his last name not be used.) A year earlier he'd cloned a Microsoft employee badge that belonged to his mother's boyfriend; he'd been using the RFID card to explore the Redmond campus ever since, passing as an employee by dressing head to toe in Microsoft swag. (Microsoft claims he didn't copy the badge but rather stole it.) The 18-year-old had already stolen one Durango for personal use; he was nervous about going back for more but also brimming with the recklessness of youth.

Around 9 pm on a late September night, Arman swiped himself into the building that housed the Durangos. A few engineers were still roaming the hallways; Arman dove into a cubicle and hid whenever he heard footsteps. He eventually climbed the stairs to the fifth floor, where he'd heard there was a cache of Durangos. As he started to make his way into the darkened floor, motion detectors sensed his presence and light flooded the room. Spooked, Arman bolted back downstairs. He finally found what he was looking for in two third-floor cubicles. One of the Durangos had a pair of stiletto heels atop the case; Arman put the two consoles in his oversize backpack and left the fancy shoes on the carpet.

A week after he sent the stolen Durangos to Pokora and Alcalá, Arman received some surprising news: A Microsoft vendor had finally reviewed an employment application he'd submitted that summer and hired him as a quality--assurance tester. He lasted only a couple weeks on the job before investigators identified him as the Durango thief; a stairwell camera had caught him leaving the building. To minimize the legal fallout, he begged Pokora and Alcalá to send back the stolen consoles. He also returned the Durango he'd taken for himself, and not a moment too soon: Jealous hackers had been scoping out his house online, as a prelude to executing a robbery.

Pokora spent all winter hacking the Xbox 360's games for Horizon. But as Toronto was beginning to thaw out in March 2014, he figured he could spare a weekend to drive down to Delaware and pick up the bumper he'd ordered for his Volkswagen Golf.

“Y’know, there’s a chance I could get arrested,” he told his dad as they prepared to leave. His father had no idea what he was talking about and cracked a thin smile at what was surely a bad joke.

VIII. "THIS LIFE AIN'T FOR YOU"

AFTER AN INITIAL appearance at the federal courthouse in Buffalo and a few days in a nearby county jail, Pokora was loaded into a van alongside another federal inmate, a gang member with a powerlifter’s arms and no discernible neck. They were being transported to a private prison in Ohio, where Pokora would be held until the court in Delaware was ready to start its proceedings against him. For kicks, he says, the guards tossed the prisoners’ sandwiches onto the floor of the van, knowing that the tightly shackled men couldn’t reach them.

During the three-hour journey, the gang member, who was serving time for beating a man with a hammer, counseled Pokora to do whatever was necessary to minimize his time behind bars. “This life ain’t for you,” he said. “This life ain’t for nobody, really.”

Pokora took those words to heart when he was finally brought to Delaware in early April 2014. He quickly accepted the plea deal that was offered, and he helped the victimized companies identify the vulnerabilities he’d exploited—for example, the lightly protected tunnels that let him hopscotch among networks. As he sat in rooms and listened to Pokora explain his hacks with professorial flair, McAndrew, the lead prosecutor, took a shine to the now 22-year-old Canadian. “He’s a very talented kid who started down a bad path,” he says. “A lot of times when you’re investigating these things, you have to have a certain level of admiration for the brilliance and creativity of the work. But then you kind of step back and say, ‘Here’s where it went wrong.’”

One day, on the way from jail to court, Pokora was placed in a marshal’s vehicle with someone who looked familiar—a pale 20-year-old guy with a wispy build and teeth marred by a Skittles habit. It was Nathan Leroux, whom Pokora had never met in person but recognized from a photo. He had been arrested on March 31 in Madison, Wisconsin, where he’d moved after the FBI raid that had scared him into dropping out of the Xbox scene. He’d been flourishing in his new life as a programmer at Human Head Studios, a small game developer, when the feds showed up to take him into custody.

As he and Leroux rode to court in shackles, Pokora tried to pass along the gang member’s advice. “Look, a lot of this was escalated because of DaE—DaE’s an asshole,” he said, using the shorthand of Wheeler’s nickname, SuperDaE. “You can rat on me or do whatever, because you don’t deserve this shit. Let’s just do what we got to do and get out of here.”

Unlike Pokora, Leroux was granted bail and was allowed to live with his parents as his case progressed. But as he lingered at his Maryland home, he grew convinced that, given his diminutive stature and shy nature, he was doomed to be raped or murdered if he went to prison. His fear became so overpowering that, on June 16, he clipped off his ankle monitor and fled.

He paid a friend to try to smuggle him into Canada, nearly 400 miles to the north. But their long drive ended in futility: The Canadians flagged the car at the border. Rather than accept that his escape had failed, Leroux pulled out a knife and tried to sprint across the bridge onto Canadian soil. When officers surrounded him, he decided he had just one option left: He stabbed himself multiple times. Doctors at an Ontario hospital managed to save his life. Once he was released from intensive care and transported back to Buffalo, his bail was revoked.

When it came time for Pokora's sentencing, his attorney argued for leniency by contending that his client had lost the ability to differentiate play from crime. "David in the real world was something else entirely from David online," he wrote in his sentencing memorandum. "But it was in this tenebrous world of anonymity, frontier rules, and private communication set at a remove from everyday life that David was incrementally desensitized to an online culture in which the line between playing a videogame and hacking into a computer network narrowed to the vanishing point." After pleading guilty, Pokora, Leroux, and Nesheiwat ultimately received similar punishments: 18 months in prison for Pokora and Nesheiwat, 24 months for Leroux. Pokora did the majority of his time at the Federal Detention Center in Philadelphia, where he made use of the computer room to send emails or listen to MP3s. Once, while waiting for a terminal to open up, a mentally unstable inmate got in his face, and Pokora defended himself so he wouldn't appear weak; the brawl ended when a guard blasted him with pepper spray. After finishing his prison sentence, Pokora spent several more months awaiting deportation to Canada in an immigration detention facility in Newark, New Jersey. That jail had PCs in the law library, and Pokora got to use his hacker skills to find and play a hidden version of Microsoft Solitaire.

When he finally returned to Mississauga in October 2015, Pokora texted his old friend Anthony Clark, who was now facing a legal predicament of his own. Alcala had told the government all about Clark's FIFA coin-minting operation. The enterprise had already been on the IRS's radar: One of Clark's workers had come under suspicion for withdrawing as much as \$30,000 a day from a Dallas bank account. Alcala connected the dots for the feds, explaining to them that the business could fool Electronic Arts' servers into spitting out thousands of coins per second: The group's code automated and accelerated FIFA's gameplay, so that more than 11,500 matches could be completed in the time it took a human to finish just one. The information he provided led to the indictment of Clark and three others for wire fraud; they had allegedly grossed \$16 million by selling the FIFA coins, primarily to a Chinese businessman they knew only as Tao.

Though Clark's three codefendants had all pleaded guilty, he was intent on going to trial. He felt that he had done nothing wrong, especially since Electronic Arts' terms of service state that its FIFA coins have no real value. Besides, if Electronic Arts executives were really upset about his operation, why didn't they reach out to discuss the matter like adults? Perhaps Electronic Arts was just jealous

that he—not they—had figured out how to generate revenue from in-game currencies.

“Yeah, I’m facing 8+ years,” Clark wrote in a text to Pokora. “And if I take the plea 3½. Either way fuck them. They keep trying to get me to plea.” “They roof you if you fail at trial,” Pokora warned. “My only concern is to educate you a bit about what it will be like. Because it’s a shitty thing to go through.” But Clark wouldn’t be swayed—he was a man of principle. That Fourth of July, Pokora wrote to Clark again. He jokingly asked why Clark hadn’t yet sent him a custom video that he’d requested: Clark and his Mexican-American relatives dancing to salsa music beneath a Donald Trump piñata. “Where’s the salsa?” Pokora asked.

The reply came back: “On my chips,” followed by the smiling-face-with-sunglasses emoji. It was the last time Pokora ever heard from his Halo 3comrade. Clark’s trial in federal district court in Fort Worth that November did not go as he had hoped: He was convicted on one count of conspiracy to commit wire fraud. His attorneys thought he had excellent grounds for appeal, since they believed that the prosecution had failed to prove the FIFA coin business had caused Electronic Arts any actual harm.

But Clark’s legal team never got the chance to make that case. On February 26, 2017, about a month before he was scheduled to be sentenced, Clark died in his Whittier home. People close to his family insist that the death was accidental, the result of a lethal interaction between alcohol and medication. Clark had just turned 27 and left behind an estate valued at more than \$4 million.

IX. "I WANTED TO SEE HOW FAR IT COULD GO"

THE MEMBERS OF the Xbox Underground have readjusted to civilian life with varying degrees of success. In exchange for his cooperation, Alcalá received no prison time; he enrolled at Ball State University and made the dean’s list. The 20-year-old brought his girlfriend to his April 2016 sentencing hearing—“my first real girlfriend”—and spoke about a talk he’d given at an FBI conference on infrastructure protection. “The world is your oyster,” the judge told him. Leroux’s coworkers at Human Head Studios sent letters to the court on his behalf, commending his intelligence and kindness. “He has a very promising game development career ahead of him, and I wouldn’t think he’d ever again risk throwing that away,” one supporter wrote. On his release from prison, Leroux returned to Madison to rejoin the company. Nesheiwat, who was 28 at the time of his arrest, did not fare as well as his younger colleagues. He struggled with addiction and was rearrested last December for violating his probation by using cocaine and opiates; his probation officer said he’d “admitted to doing up to 50 bags of heroin per day” before his most recent stint in rehab.

Because Wheeler had been a juvenile when most of the hacking occurred, the US decided to leave his prosecution to the Australian authorities. After being given 48 hours to turn in his passport, Wheeler drove straight to the airport and absconded to the Czech Republic, his mother’s native land. The Australians imprisoned his mother for aiding his escape, presumably to pressure him into returning home to face

justice. (She has since been released.) But Wheeler elected to remain a fugitive, drifting through Europe on an EU passport before eventually settling in the UK. During his travels he tried to crowdfund the purchase of a \$500,000 Ferrari, explaining that his doctor said he needed the car to cope with the anxiety caused by his legal travails. (The campaign did not succeed.)

Pokora, who is now 26, was disoriented during his first months back in Canada. He feared that his brain had permanently rotted in prison, a place where intellectual stimulation is in short supply. But he reunited with his girlfriend, whom he'd begged to leave him while he was behind bars, and he reenrolled at the University of Toronto. He scraped together the tuition by taking on freelance projects programming user-interface automation tools; his financial struggles made him nostalgic for the days when he was rolling in Call of Duty cash.

When he learned of Clark's death, Pokora briefly felt renewed bitterness toward Alcalá, who'd been instrumental to the government's case against his friend. But he let the anger pass. There was nothing to be gained by holding a grudge against his onetime fellow travelers. He couldn't even work up much resentment against Justin May, whom he and many others are certain was the Delaware-based FBI informant identified as Person A in the Xbox Underground indictment. ("Can't comment on that, sorry," May responded when asked whether he was Person A. He is currently being prosecuted in the federal district of eastern Pennsylvania for defrauding Cisco and Microsoft out of millions of dollars' worth of hardware.)

Pokora still struggles to understand how his love for programming warped into an obsession that knocked his moral compass so far askew. "As much as I consciously made the decisions I did, I never meant for it to get as bad as it did," he says. "I mean, I wanted access to companies to read some source code, I wanted to learn, I wanted to see how far it could go—that was it. It was really just intellectual curiosity. I didn't want money—if I wanted money, I would've taken all the money that was there. But, I mean, I get it—what it turned into, it's regrettable."

Pokora knows he'll forever be persona non grata in the gaming industry, so he's been looking elsewhere for full-time employment since finishing the classwork for his computer science degree last June. But he's had a tough time putting together a portfolio of his best work: At the behest of the FBI, Canadian authorities seized all of the computers he'd owned prior to his arrest, and most of the software he'd created during his Xbox heyday was lost forever. They did let him keep his 2013 Volkswagen Golf, however, the car he adores so much that he was willing to drive to Delaware for a bumper. He keeps it parked at his parents' house in Mississauga, the place where he played his first game at the age of 2, and where he's lived ever since leaving prison.

Adapted from The Wired

Why You Never See Your Friends Anymore

Our unpredictable and overburdened schedules are taking a dire toll on American society.

Just under a century ago, the Soviet Union embarked on one of the strangest attempts to reshape the common calendar that has ever been undertaken. As Joseph Stalin raced to turn an agricultural backwater into an industrialized nation, his government downsized the week from seven to five days. Saturday and Sunday were abolished.

In place of the weekend, a new system of respite was introduced in 1929. The government divided workers into five groups, and assigned each to a different day off. On any given day, four-fifths of the proletariat would show up to their factories and work while the other fifth rested. Each laborer received a colored slip of paper—yellow, orange, red, purple, or green—that signified his or her group. The staggered schedule was known as *nepreryvka*, or the “continuous workweek,” since production never stopped.

Socially, the *nepreryvka* was a disaster. People had no time to see friends; instead they associated by color: purple people with purple people, orange with orange, and so on. Managers were supposed to assign husbands and wives to the same color but rarely did. The Communist Party saw these dislocations as a feature, not a bug, of the new system. The Party wanted to undermine the family, that bourgeois institution. “Lenin’s widow, in good Marxist fashion, regarded Sunday family reunions as a good enough reason to abolish that day,” according to E. G. Richards, the author of *Mapping Time*, a history of the calendar.

Workers, however, were upset. One of them openly complained to *Pravda*: “What are we to do at home if the wife is in the factory, the children in school, and no one can come to see us? What is left but to go to the public tea room? What kind of life is that—when holidays come in shifts and not for all workers together? That’s no holiday, if you have to celebrate by yourself.”

The staggered workweek didn’t last long. Officials worried that it affected attendance at workers’ meetings, which were essential for a Marxist education. In 1931, Stalin declared that the *nepreryvka* had been implemented “too hastily,” leading to a “depersonalized labor process” and the mass breakage of overtaxed machines. That year, the government added a day of collective rest. The seven-day week was not restored until 1940.

Experiments like this one have given social engineering a bad name. Nevertheless, Americans are imposing a kind of *nepreryvka* on ourselves—not because a Communist tyrant thinks it’s a good idea but because the contemporary economy demands it. The hours in which we work, rest, and socialize are becoming ever more desynchronized.

Whereas we once shared the same temporal rhythms—five days on, two days off, federal holidays, thank-God-it’s-Fridays—our weeks are now shaped by the unpredictable dictates of our employers. Nearly a fifth of Americans hold jobs with nonstandard or variable hours. They may work seasonally, on rotating shifts, or in the gig economy driving for Uber or delivering for Postmates. Meanwhile, more people on the upper end of the pay scale are working long hours. Combine the people who

have unpredictable workweeks with those who have prolonged ones, and you get a good third of the American labor force.

The personalization of time may seem like a petty concern, and indeed some people consider it liberating to set their own hours or spend their “free” time reaching for the brass ring. But the consequences could be debilitating for the U.S. in the same way they once were for the U.S.S.R. A calendar is more than the organization of days and months. It’s the blueprint for a shared life.

Remember the old 9-to-5, five-day-a-week grind? If you’re in your 30s or younger, maybe not. Maybe you watched reruns of *Leave It to Beaver* and saw Ward Cleaver come home at the same time every evening. Today few of us have workdays nearly so consistent. On the lower end of the labor market, standing ready to serve has become virtually a prerequisite for employment. A 2018 review of the retail sector called the “Stable Scheduling Study” found that 80 percent of American workers paid by the hour have fluctuating schedules. Many employers now schedule hours using algorithms to calculate exactly how many sets of hands are required at a given time of day—a process known as on-demand scheduling. The algorithms are designed to keep labor costs down, but they also rob workers of set schedules. The inability to plan even a week into the future exacts a heavy toll. For her recent book, *On the Clock*, the journalist Emily Guendelsberger took jobs at an Amazon warehouse, a call center, and a McDonald’s. All three companies demanded schedule flexibility—on their terms. The most explicit about the arrangement was Amazon. While filling out an online application, Guendelsberger found the following advisory: “Working nights, weekends, and holidays may be required ... Overtime is often required (sometimes on very short notice) ... Work schedules are subject to change without notice.”

One Amazon co-worker told Guendelsberger that she barely saw her husband anymore. He worked the night shift as a school custodian and came home to sleep an hour before she woke up to go to work. “We have Sunday if I’m not working mandatory overtime, and occasionally we have Monday morning—if I don’t have to work Monday morning—to see each other, and that’s pretty much it,” she said.

On the other end of the labor force are the salaried high earners for whom the workday and workweek remain somewhat more predictable. But their days and weeks have grown exceedingly long. For her 2012 book, *Sleeping With Your Smartphone*, the Harvard Business School professor Leslie Perlow conducted a survey of 1,600 managers and professionals. Ninety-two percent reported putting in 50 or more hours of work a week, and a third of those logged 65 hours or more. And, she adds, “that doesn’t include the twenty to twenty-five hours per week most of them reported monitoring their work while not actually working.” In her 2016 book, *Finding Time: The Economics of Work-Life Conflict*, the economist Heather Boushey described the predicament in stark terms: “Professionals devote most of their waking hours to their careers.”

When so many people have long or unreliable work hours, or worse, long and unreliable work hours, the effects ripple far and wide. Families pay the steepest

price. Erratic hours can push parents—usually mothers—out of the labor force. A body of research suggests that children whose parents work odd or long hours are more likely to evince behavioral or cognitive problems, or be obese. Even parents who can afford nannies or extended day care are hard-pressed to provide thoughtful attention to their kids when work keeps them at their desks well past the dinner hour. To make the most efficient use of their scant time at home, some parents have resorted to using the same enterprise software that organizes their office lives: Trello for chores, to-do lists, and homework; Slack to communicate with the kids or even to summon them to dinner. Anyone raising a teenager knows that nagging is more effective electronically than face-to-face.

Keeping up a social life with unreliable hours is no easy feat, either. My friends and I now resort to scheduling programs such as Doodle to plan group dinners. Committing to a far-off event—a wedding, a quinceañera—can be a source of anxiety when you don't know what your schedule will be next week, let alone next month. Forty percent of hourly employees get no more than seven days' notice about their upcoming schedules; 28 percent get three days or fewer. What makes the changing cadences of labor most nepreryvka-like, however, is that they divide us not just at the micro level, within families and friend groups, but at the macro level, as a polity. Staggered and marathon work hours arguably make the nation materially richer—economists debate the point—but they certainly deprive us of what the late Supreme Court Justice Felix Frankfurter described as a “cultural asset of importance”: an “atmosphere of entire community repose.”

I know this dates me, but I'm nostalgic for that atmosphere of repose—the extended family dinners, the spontaneous outings, the neighborly visits. We haven't completely lost these shared hours, of course. Time-use studies show that weekends continue to allow more socializing, civic activity, and religious worship than weekdays do. But Sundays are no longer a day of forced noncommerce—everything's open—or nonproductivity. Even if you aren't asked to pull a weekend shift, work intrudes upon those once-sacred hours. The previous week's unfinished business beckons when you open your laptop; urgent emails from a colleague await you in your inbox. A low-level sense of guilt attaches to those stretches of time not spent working.

As for the children, they're not off building forts; they're padding their college applications with extracurricular activities or playing organized sports. A soccer game ought to impose an ethos of not working on a parent, and offer a chance to chat with neighbors and friends. Lately, however, I've been seeing more adults checking their email on the sidelines. Is there any hope for clawing back some shared time off? In *Sleeping With Your Smartphone*, Perlow describes how she developed a solution to white-collar peonage at Boston Consulting Group. She called her strategy “PTO”: predictable time off. It didn't seem like a big deal. Teams would pull together to arrange one weeknight off per member per week. Not at the same time—clients still expected someone to be on call at all hours—but on different nights.

PTO turned out to be surprisingly complicated. Schedules had to be repeatedly adjusted to ensure that all evenings were covered. Not everyone liked the new system. “Bob,” for instance, didn’t want to take his night off while he was on the road; he would have preferred to spend that time with his family.

Still, Perlow and Boston Consulting Group deemed PTO a success, and it has since been adopted elsewhere. Drill down on why, though, and the answer does more to confirm the problem than suggest a solution. PTO made people meet more frequently and talk frankly to one another. They had to explain why a particular night wouldn’t work for them. They bonded. It was the together time, not the nights off, that made employees happier and more effective.

The “opt out” movement comes at the problem from a different angle. Its proponents call for people to reject the cult of busyness, in part by rejecting the notion that, as Jenny Odell writes in *How to Do Nothing*, our every minute should be “captured, optimized, or appropriated as a financial resource by the technologies we use daily.” But it’s one thing to delete Instagram from your phone so you can be more present for your wife and kids. It’s another to decide unilaterally that your boss’s emails can wait until morning.

And for those on the lower rungs of the economy, there’s no ignoring the scheduling algorithm—at least as long as the algorithm is king. In her 2014 book, *The Good Jobs Strategy*, the MIT business professor Zeynep Ton argues that on-demand scheduling may prove to have higher costs than benefits: Companies, especially ones that depend on customer service, lose money and market share when they desynchronize their labor force. She offers the example of Home Depot. When it opened in 1979, the company invested in full-time workers with home-improvement expertise. It quickly became the market leader. But then Home Depot began losing money, largely because of inefficient operations. In 2000, a new CEO imposed discipline in the company. However, seeking to cut labor costs, he also imposed “flexible” schedules. Home Depot started hiring more part-timers, most of them less knowledgeable than the full-timers. Customers couldn’t find anyone to help them navigate the store, and checkout lines became punishingly long. By 2005, Home Depot had plunged below beleaguered Kmart on the American Customer Satisfaction Index.

The Gap, IKEA, and a handful of other retailers have been trying to figure out how to mitigate the damage of inconsistent shifts. They are testing fixes such as making start and end times more consistent and giving no less than two weeks’ notice of upcoming schedules, among other things.

But it’s naive to think that policies like this will become the norm. Wall Street demands improved quarterly earnings and encourages the kind of short-term thinking that drives executives to cut their most expensive line item: labor. If we want to alter the cadences of collective time, we have to act collectively, an effort that is itself undermined by the American nepravlyva. A presidential-campaign field organizer in a caucus state told me she can’t get low-income workers to commit to coming to

meetings or rallies, let alone a time-consuming caucus, because they don't know their schedules in advance.

Reform is possible, however. In Seattle, New York City, and San Francisco, "predictive scheduling" laws (also called "fair workweek" laws) require employers to give employees adequate notice of their schedules and to pay employees a penalty if they don't.

Then there's "right to disconnect" legislation, which mandates that employers negotiate a specific period when workers don't have to answer emails or texts off the clock. France and Italy have passed such laws.

It's a cliché among political philosophers that if you want to create the conditions for tyranny, you sever the bonds of intimate relationships and local community. "Totalitarian movements are mass organizations of atomized, isolated individuals," Hannah Arendt famously wrote in *The Origins of Totalitarianism*. She focused on the role of terror in breaking down social and family ties in Nazi Germany and the Soviet Union under Stalin. But we don't need a secret police to turn us into atomized, isolated souls. All it takes is for us to stand by while unbridled capitalism rips apart the temporal preserves that used to let us cultivate the seeds of civil society and nurture the sadly fragile shoots of affection, affinity, and solidarity.
Adapted from the Atlantic